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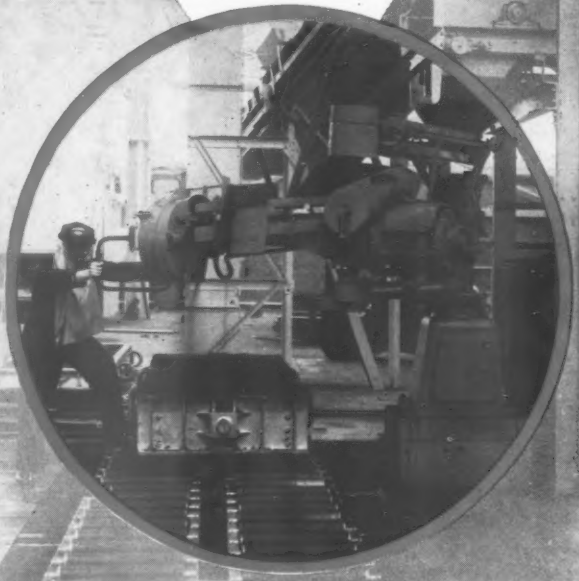

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Assistant Editor: A. R. PARKES, M.I.B.F.

Commercial Editor P. E. CARDEN.

Advertising Manager:
F. BARRINGTON HOOPER, B.A.

Production Manager:
R. J. LOVELL

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Census of Production for Iron Foundries, 1954

By Philip Moore, B.Com., M.A.

In this article an attempt is made to use the statistics on iron foundries which are included in the 1954 Census Report as a basis for estimating corresponding figures for the industry as a whole, that is, as taken over a wider and more comprehensive field than can come within the scope of the Report itself. Gaps in the existing information are indicated and points at which the interpretation of statistical fact requires caution are concisely noted 73

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Recensement de la Production des Fonderies de Fonte pour 1954. Par Philip Moore, B.Com., M.A. Dans cet article l'auteur tente d'utiliser les statistiques sur les fonderies de fonte, qui étaient incluses dans le rapport officiel de 1954, comme base pour estimer des chiffres correspondants pour l'industrie en général, c'est à dire, comprenant un domaine plus vaste et plus complet que celui que peut couvrir le rapport officiel. Les lacunes dans les renseignements existants y sont indiquées et les points où l'interprétation de la statistique demande de la prudence y sont exposés d'une façon concise 73

"Porte ouverte sur l'Avenir." La seconde partie de cet article complet et détaillé sur la nouvelle usine pour coulées de précision de Samuel Osborn & Company, Limited à Holbrook, près de Sheffield, illustre la grande variété de coulées dont la companie s'est déjà occupée et emet quelques reflexions sur l'importance d'une telle entreprise. 77

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"Ein tor in die Zukunft." Der zweite Teil dieses umfassenden Artikels über die neue Genaugiesserei der Firma Samuel Osborn & Company, Limited, in Holbrook bei Sheffield bespricht die Mannigfaltigkeit der Gussstücke, mit denen sich die Firma bisher befasst hat und bringt einige Betrachtungen hinsichtlich der Bedeutung dieses kühnen Unternehmens zum Ausdruck. 77

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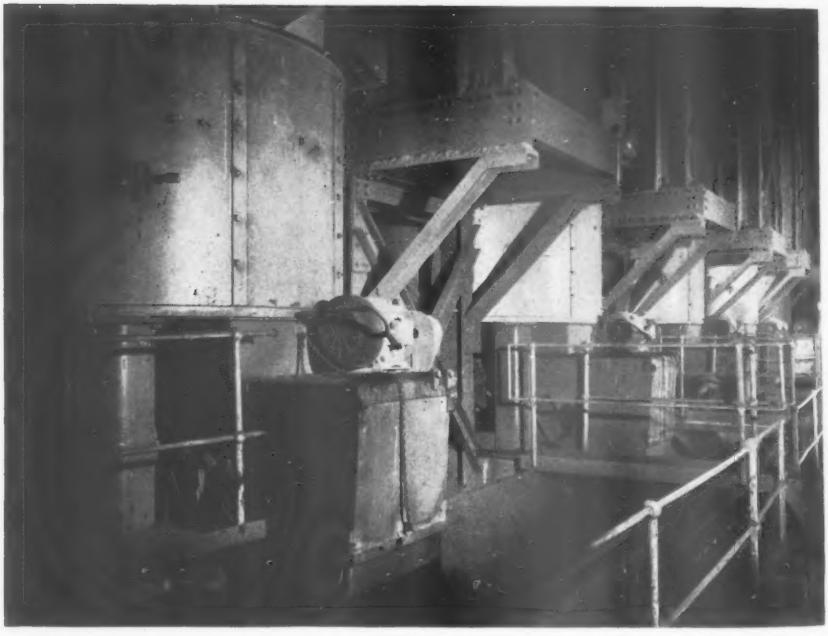
AUGUST-SIMPSON Mix-Mullers at work...

in one of Britain's Largest Foundries

Unretouched photograph published by courtesy of **Messrs. STERLING METALS LTD. NUNEATON**



Sole Licensees and Manufacturers for the British Empire (excluding Canada, Australia and New Zealand) of the Simpson Sand Mixer.

Photograph shows Five No. 3F size AUGUST-SIMPSON MIX-MULLERS, fitted with Aerators, feeding mixed sand on to a Distributing Belt Conveyor. Each Mix-Muller has a batch capacity of 4,000 lb.

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FOUNDRY
TRADE JOURNAL

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Small Firms with Big Problems*

Using Conditional Aid Funds, the Scottish Council (Development and Industry) during 1955 and 1956 engaged three retired executives, who visited 109 medium- and small-size firms in Scotland to help them to solve some of their most pressing problems. They received 223 and solved 160. This success was achieved in the main, not because the investigators were supermen, but rather on account of their knowledge of sources of information. A similar scheme was operated with signal success by the National Union of Manufacturers, but that was confined to their own members. In this report, the major source used by the co-operating companies was "other firms," but little information is given as to exactly what is implied. If such organizations as those connected with the development of copper, lead, aluminium, nickel, zinc and the like, be implied, then we deem that mention should have been made of their great usefulness.

The foundries come in for special comment, and we are told that very little research work is being undertaken for, or by, the non-ferrous founder *vis-à-vis* with the heavy demand for such metals and the amount of research being carried out in association with chemical and atomic-energy development. It seemed that further ways should be studied of using this research to help foundries develop a more progressive outlook.

Praise was given to three research associations:—The British Cast Iron Research Association, the Welding Research Association, and the British Iron and Steel Research Association. The first two came in for special commendation because they operated branches in Scotland, whilst BISRA was recommended to do likewise. Perhaps the major lesson to be had from this report, which is in reality a contribution to the problem of making available the research results to the smaller industrial enterprises, is that this can best be done by decentralization. People and firms much prefer telephoning the branch office than writing to headquarters. So far as the foundry industry is concerned, there is a large volume of opinion favourable to such expansion. Our readers would do well to obtain a copy of the really interesting industry report.

* Booklet published by the Department of Scientific and Industrial Research and available free of charge from the DSIR Lending Library Unit, 20 Chester Terrace, Regents Park, London, N.W.1.

Correspondence

KEEPING UP WITH THE JONES'S

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—Although perhaps I do not understand all the implications of Mr. Tripp's letter published in your issue of July 3 on the above subject, and which appeared following your "Leader" of June 5, I see plainly that he does not feel the need for prompting the Council of Ironfoundry Associations to take steps, on behalf of ironfounders, to acquire prestige with the general public. But, of course, the industry is comprised of many who cast metals other than iron. Despite what the CFA is doing, the knowledge of the general public regarding the ironfoundry industry is still limited by old impressions which die hard. They still picture themselves stumbling through a heap of dry sand to the main foundry and from there to the fettling shop, and seeing a great pile of castings, with an unfortunate labourer struggling—in vain—to find the particular casting wanted from underneath the month's output.

That this is not the true story to-day I, myself, need no convincing, as the improvement in the general conditions of most iron foundries, in the last 40 years, is astounding. Nevertheless, in my opinion, a way to continue bringing prestige to this old craft is to produce good castings at proper prices and with promise of good delivery and service to clients. This can be the finest publicity obtainable.

I think your JOURNAL has served, and is serving, the needs of all foundries in general and the ironfoundry trade in particular, but of course, it isn't read by the general public. Thus, it is up to all of us in the industry to enhance its prestige on as wide as possible a basis.—Yours faithfully,

A. L. PARROTT.

Morden,
Surrey.

CONDITIONS OF PURCHASE

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—May I refer to your issue of June 19 wherein you deal with conditions of purchase, with particular reference to the booklet produced by the Economic Survey Committee of the Purchasing Officers Association. Naturally, we are pleased you have recorded your general appreciation of this publication and that you feel it should not be difficult to achieve our long-term project of a set of conditions common to both seller and buyer.

I should like to refer particularly to the two clauses you have questioned. First, the ownership of patterns (or tools) is quite clearly that of the buyer if he has commissioned the seller to make or procure the pattern and for which the buyer has agreed to defray the full cost, the seller having tendered on the basis of this condition. On the other hand, if in producing the pattern he employs a special technique of his own, the seller is unlikely to agree to the pattern becoming the property of the buyer. He will protect himself by quoting a part cost only, the pattern to remain his property and, in such circumstances, there are no grounds for a buyer to refuse; it would be quite unreasonable (and no firm of standing would resort to such a practice) to endeavour to secure a condition which would allow one supplier's know-how to be passed to another supplier. Quite often the cost of patterns can be included in the part price with no reference ot it separately and in such cases the property is quite clearly that of the seller just as much as any other part of his moulding equipment.

I do not understand your second query which relates to the buyer being the sole arbiter as to whether or not the goods are acceptable because of the notion that the firm's inspectorate might have different views from its buying department. We must remember that the use of the term "buyer" throughout the clauses denotes the buying company of which the inspectorate is a part. It is usual for companies to lay down standards or to provide drawings or specifications covering bought out supplies and it is the duty of the buyer to bring to the notice of the seller these requirements and to order on the basis that they shall be met. The buying firm's inspectorate must satisfy itself that the specified requirements have been duly complied with and, if not, to reject the goods. It would be most unusual for a buyer to reject goods which his inspectorate had passed—on what grounds can he indeed do so? On the other hand, it is not unusual for a buyer to intercede on behalf of his supplier if he believes his inspectorate is being unduly exacting.

As we have indicated in our booklet we have no desire to set up conditions of purchase which seek to impose any unreasonable undertaking on the part of the seller.—Yours, etc.,

ARTHUR ELLIOTT,
Chairman, Economic Survey Committee.
Purchasing Officers Association,
146A, Queen Victoria Street,
London, E.C.4.
July 7, 1958.

Association of Light Alloy Refiners and Smelters

Amalgamation between ALAR, Limited, and the Federation of Light Metal Smelters has been carried through and their activities will be continued under the name of the Association of Light Alloy Refiners & Smelters, Limited, with registered offices at 1, Frederick's Place, Old Jewry, London, E.C.2 (telephone: MONarch 9988).

The preparation, publication, and dissemination of technical information previously undertaken by ALAR will be undertaken by the new association and the technical advisory office at 3, Albemarle Street, London, W.1 (telephone: MAYfair 2091), will continue under Mr. F. H. Smith, technical officer.

The members of the association are:—Associated Lead Manufacturers, Limited; Atkins "Metals," Limited; B.K.L. Alloys, Limited; John Cox & Sons (Metals), Limited; John Dale, Limited; Enfield Rolling Mills (Aluminium), Limited; Eyre Smelting Company, Limited; J. Frankel (Aluminium), Limited; International Alloys, Limited; John E. Moore, Limited; Norton Aluminium Products, Limited; T. J. Priestman, Limited; Wigley Aluminium, Limited; Wolverhampton Metal Company, Limited. The Council of management consists of:—Mr. R. Hahn (chairman); Dr. J. Jakobi (vice-chairman); Mr. B. Endlar; Mr. O. G. Halliwell; Mr. R. Hopkins; Mr. E. W. Nicholls.

EDGAR ALLEN & COMPANY, LIMITED, Sheffield, is to supply and instal dock rail on berths 11 and 12 at Mombasa Harbour, East Africa. Orders for rail trackwork from Ceylon have also been obtained by the company.

FIRST of two 163-ton electric furnaces for Canadian Steel Wheel, Limited, Montreal, was shipped by the makers, G. W. B. Furnaces, Limited, Dudley (Worcs), on July 10. The second will be shipped in about three months.

Shotton Bros., Developments

First-stage of Halesowen Works Completed

Shotton Bros. came into being in 1896, when the two brothers of the present chairman, Mr. E. R. Shotton, established themselves as ironfounders at Smethwick, and in 1916, moved to a new site at Manchester Street Foundry, Oldbury. Steady progress was recorded over the decades, but some two years ago, it was felt that extra manufacturing space was required to cope with increasing business. After a prolonged search, a freehold site was found at Halesowen. The site is triangular in shape, with one edge contiguous with the railway. A fair amount of levelling was necessary, but the final outcome is that for some time to come, the refuse from the foundry can be used for further ground-levelling operations.

On Monday, the shop was officially opened. It is of modern design and construction and occupies an area of 240 ft. by 180 ft. plus the melting bay. All the various departments are housed within the shop —the offices, sand-preparation, moulding, core-making, annealing, fettling, amenities and laboratory —but there is ample room on the site for additional buildings should they ever be needed. The present plant occupies only one-sixth of the ten-acre site. It is intended as the first of a number of similar units, each having a capacity of about 80 tons of castings per week. The services and flow of work have been so arranged that a second unit could be built against the north-west wall as a mirror image replica of the present one and the whole operated as a single plant.

Sand Preparation

As sand is the main material in foundry practice and as the bulk of this comes from the knock-out (Fig. 1), logic suggests this point as being the best to initiate a description of a mechanized foundry. It is here that the cast-up boxes arrive on a pallet conveyor from the cooling tunnel; they are placed on a side-ventilated Sterling knock-out and when freed from sand, are put back on a roller conveyor to return to the moulding-machine line. The castings are placed into stillages for transfer to the cleaning plant. The sand, falling through the knock-out grid, feeds a cross belt—also carrying any excess sand from the overhead moulding-machine feed-belt—and spills on to an 18-in. inclined belt conveyor to fill storage hoppers, after passing by a "Rapid" magnet and rotary screen. The ploughs on the belt are arranged so that they can fill any one of three hoppers—two for the sand system and one for excess-sand disposal. The feed belt also receives new sand from an underground hopper, whilst there are two vibratory feeders—automatically controlled—for adding Fulbond and pelleted pitch. The hoppers have, at their base, a rotary table closure, which, by ploughs, feeds into skip loading August Simpson sand mills. A partial view of the sand plant and the foundry is shown in Fig. 2.

The controls of the sand plant are electrically interlocked to prevent any operation occurring before the next item of plant is ready to receive it; for example, one batch mill cannot receive a second charge until the one already in it has been discharged. A check timer, set to operate a few seconds after all the feed timers should have cut off, comes into operation if any fails to do so and gives immediate warning to the staff. The control panel (Fig. 3), on which the pre-set timers are placed, is located in the compressor house and is under the direct control of the laboratory staff, who also carry out the

FIG. 1.—*Sterling knock-out. Cast-up boxes arrive on a pallet conveyor to the right of the picture; the boxes return by roller conveyor to the moulding-machine line and the castings are placed into stillages to cool for removal to the shotblast.*

standard routine tests on the sand at half-hourly intervals; these include determination of moisture, green-strength compression test, shatter test and permeability test. The sand-control equipment was specially made for Shottons by Field and Grant, Limited, of Birmingham.

The major difficulty initially encountered was to control the water intake, as mains pressure is by no means constant. However, by installing a Birflo constant-flow valve, pressure and time have been synchronized with good results. Thus, by regular sampling and a knowledge of the number of batches

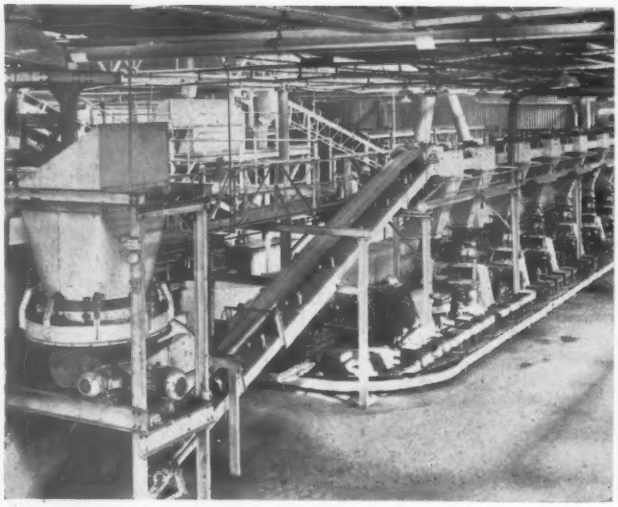


FIG. 2.—*General view of the sand-distribution system extending from the milled-sand hopper to the moulding plant.*

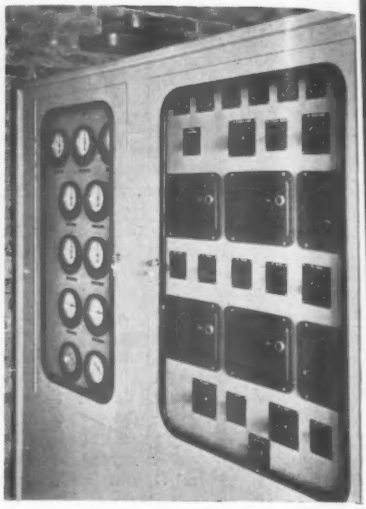


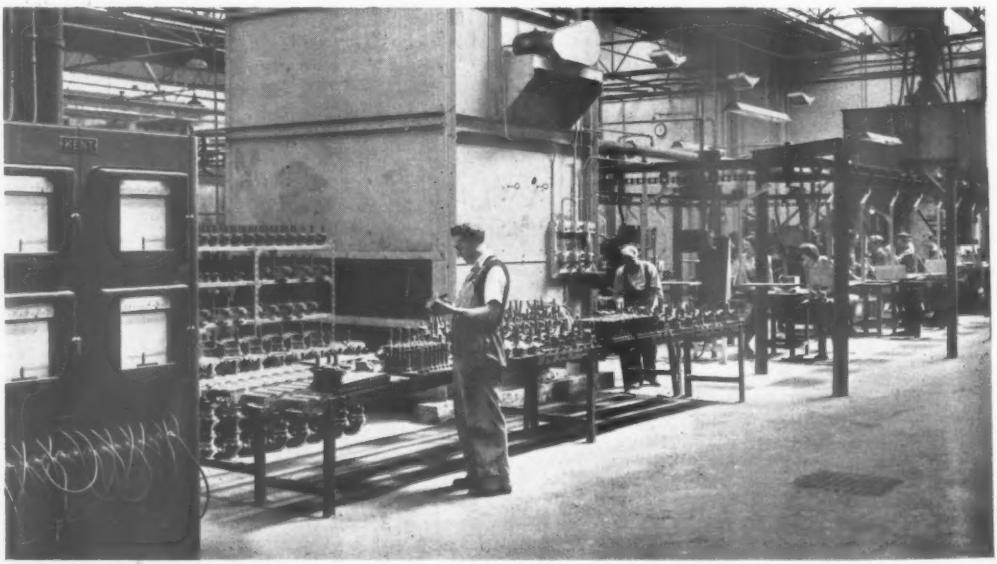
FIG. 3.—*Control panel for the automatic sand plant.*

to be milled per shift, a practical automatic control is assured. This, however, is enhanced by the fact that the sand leaving the mill fills a distribution hopper, having a rotary table closure, which feeds a 2-ft. wide belt spanning the line of moulding machines. Ploughing off is affected by a series of easily variable open-ended V's placed over the mould hoppers giving progressively increasing width of apertures. Sand requirements in excess of moulding needs drop down a chute at the end of the line to feed a belt for return to the general system.

Core-sand Preparation and Coremaking

Water is removed from the incoming silica sand

FIG. 4.—*General view of the coreshop where the cores are dried in an Acme continuous stove.*



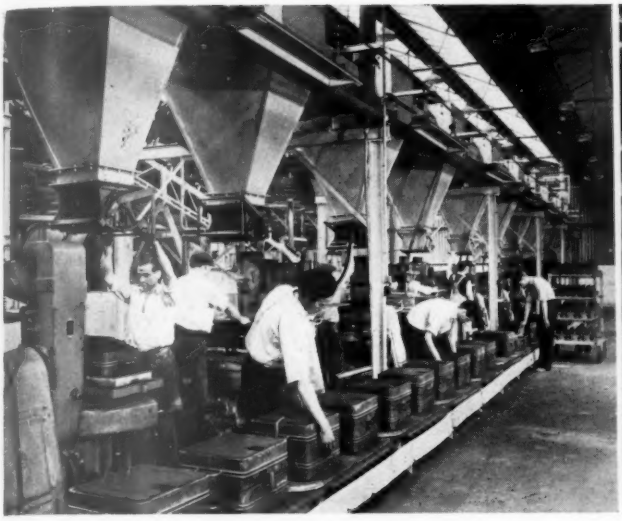


FIG. 5.—*The moulding machine line uses British Moulding Machine Company's plant. Coreing up is done whilst the mould conveyor is moving.*

FIG. 6.—*Pouring is carried out from monorail-suspended ladles, whilst the mould conveyor is moving.*

by a rotary drier supplied by Modern Furnaces, Limited. The plant is operated on a closed-circuit system, which ensures that no dust escapes into the atmosphere. The actual mixing is carried out in a Polford core-sand mixer, the bond being a dextrine-oil mixture supplied as a powder. The mixed core sand is transported on wheeled bogies to service six small Osborn coreblowers and one large one. The cores, resting on plates or carriers, go down a pendulum conveyor which passes near the charging side of an Acme vertical oil-fired stove (Fig. 4). On removal, they are inspected—not blacked—and placed on trolleys carrying racks and transported to the mould conveyor.

Moulding

The hoppers, with two sides vertical and two at an angle, are giving good service and there was but little evidence of sand release by hammering. The moulding machines (Fig. 5) are British Moulding Machine Company's Type BT.1. These are, of course, power-driven turnover machines. There are four making drags and four copes, with two additional machines as standbys for pattern changes. Here, 18 by 14 by 6-in. deep Bilston steel moulding boxes have been standardized for use on this plant. It has been deemed wise not to mount the machines on a grid with a spill conveyor beneath, as such a system involves a heavy capital expenditure and upkeep, only warranted by the largest production units. The moulds are placed on a power-driven conveyor, upon which coreing-up is done whilst the platforms are moving. Supplies of cores are available from wheeled trucks carrying racks. As most of the moulds are heavily cored, this has to be well organized to ensure speed. The mould conveyor takes the boxes to the pouring area (Fig. 6) adjacent to the melting units for casting up, using 3-cwt. capacity monorail-suspended ladles. These are prepared for use in a special area, using oil-fired burners to dry out the linings.

Melting

For melting, three 7-ton capacity Stein & Atkinson rotary furnaces are installed (Fig. 7). As these are upended for charging, a platform, served by a hoist, has been provided. On it, the weighed charges are merely pushed down a chute for charging the furnace. The tapping of the furnace resembles that of a cupola and makes use of a taphole near one end of the furnace.

Extremely narrow analytical limits need to be maintained if a desirable carbon-silicon balance and consequently a high-quality product is to be assured; a tolerance of less than 0.1 per cent. in the carbon content (normally 2.4 per cent., but may be varied to suit special requirements) is easily maintained, while the silicon content is kept within 0.04 per cent. of the desired value. These limits are achieved by using three batch melting furnaces, their heats being staggered to provide a continuous supply of molten metal of controlled composition. Each ingredient of the charge is carefully weighed, batches of raw material being stored in separate pens and their composition checked against the suppliers' stated analysis. Two samples are taken from each melt before it is poured and a rapid chemical analysis carried out on each, to determine their carbon, silicon and, if necessary, manganese contents. If the first analysis reveals a discrepancy in the amount of any component, additional metal is added before the second sample is taken. During

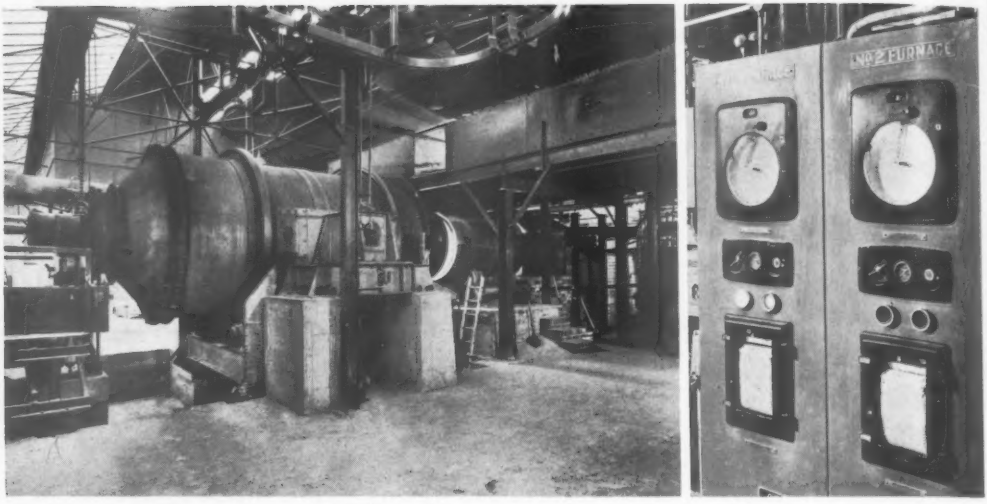


FIG. 7.—*One of the seven-ton capacity oil-fired Stein & Atkinson rotary melting furnaces, together with a view of two of the furnace control panels.*

pouring, samples are taken every 15 minutes. The chemical analysis of each sample occupies 20 to 25 minutes, so that changes in composition are quickly detected. Should the composition of a batch of castings fall outside the desired limits, this can be compensated for by an appropriate adjustment to the annealing treatment; every effort is, however, made to keep to the standard limits of composition so that the annealing treatment may also be standardized.

The rotary melting furnaces have an individual capacity of seven tons and can be tilted to facilitate charging and slag clearance. They are fired with creosote pitch which is fed to them through a metering pump at a controlled temperature from a heated outside storage tank. Recuperators supply a controlled weight of hot air. The temperature of the metal when tapped from the furnaces is checked by means of an optical pyrometer and maintained within ± 20 deg. C. Thus, each facet of the melting operation is carefully controlled, under the direction of the laboratory staff.

A test-bar is cast from each melt for determination of tensile strength, yield point and elongation, to ensure that these conform to the requirements of the highest grade specified in British Standard 310.

Treating the Castings

It would appear that there is some metallurgical advantage in allowing the castings from the knock-out to cool in stillage. After knocking off the runners and risers, the castings are put through an 8-ft. dia. Tilghman's airless rotary table machine. They are unloaded on to a 9-ft. dia. turntable for inspection; this is situated alongside a roller

FIG. 8.—*Charging system for the continuous oil-fired annealing furnace.*

FIG. 9.—*Fettling area, serviced by roller conveyors, relies largely on double-ended grinders—dust is extracted by the BCIRA system.* FIG. 10 (*below*) *shows the inspection turntable.*

conveyor bounding the annealing area. Here, 27-in. dia. canisters, made from 0.5 per cent. Cr. 1 to 1.5 per cent. Mn. casting iron. The castings are packed, using no packing media, as blackheart malleable cast iron and pearlitic malleable are manufactured. These canisters last about a year, or about 35 heats. There are 18 trucks loaded with canisters in the furnace (Fig. 8) and six or seven on the return line. The oil-fired furnace, which is 108-ft. long, has been designed by Shotton engineers. It is of the type of one in and one out, and carries four distinct areas, each one of which is temperature regulated through positive control motorized oil valves. The complete annealing cycle is of the order of six days. The furnace is particularly well instrumented both for direct control and continuous recording.

Serving the fettling area is a continuous line of roller conveyors (Fig. 9). Practically all cleaning operations are carried out on four double-ended grinders, supplemented by some quite small ones for cleaning up intricate corners. There is a hand-fettling bench, but this is not much used. Though every care is taken in packing the castings for anneal to avoid warpage, some need straightening and for this purpose, either the friction driven press is used or using sheet-metal gauges, the operation is done by hand. All castings are again shot-blasted in a plant which is the duplicate of that used for the hard castings. Again, a turntable is used for final inspection before despatch (Fig. 10).

Conclusions

This foundry is designed for an output of 80 tons per week, but in common with several others, was suffering from the aftermath of the Swindon strike of motor-car body builders, during which stocks of

Shotton Bros., Developments

castings were accumulated. It should not be long now before buying is resumed. The main differences between this new foundry and its pre-war counterparts are the attention that has been given to instrumentation, reduction of manual effort by mechanization, the provision of excellent washing and bathing facilities, canteen service and continuity of production. In this last case, instead of one large compressor plant, three of smaller size have been installed. At the moment, the shop employs about 50 men—later to be increased to 100—who have been recruited locally. Apart from a small staff, only three men have been "seconded" from the Oldbury works to look after initial training of the new labour force.

Occupational Diseases

Regulations altering the schedule of occupational diseases for which workers in specified occupations are covered for the benefits of the Industrial Injuries Act have been made by the Minister of Pensions and National Insurance, Mr. John Boyd-Carpenter. The regulations, which came into operation last week, cover 40 out of the 42 industrial diseases prescribed under the Act. The two others, pneumoconiosis and byssinosis, are both lung conditions caused by dust and are already covered separately by special provisions which have been revised within the last five years.

Among the changes is the widening of the description of poisoning by some substances, *e.g.*, lead and benzene, to include certain of their compounds. Extensions are also made in the definitions of other diseases including industrial dermatitis, radiation injuries, and cramps of the hand or arm caused by repetitive movements. Special benefit provisions are made for persons who have already contracted a disease, in a form now covered by the extension of the regulations, between July 5, 1948, when the Industrial Injuries schemes began, and July 7, 1958. They can receive benefit from July 7 provided that, on that date, they are either incapacitated for work or suffering from a loss of faculty, as a result of the disease.

Head, Wrightson's Order Book

Some of the larger orders on the books of Head, Wrightson & Company, Limited, engineers, iron and steel founders, etc., of Thornaby-on-Tees (Yorks), will take three or four years to execute, states the chairman, Mr. Richard Miles, in his annual report. Unless there is a general upward turn in both home and foreign markets, however, it cannot be expected that trading results will continue their improvement indefinitely.

Good progress is being continued in South Africa, but trading is still difficult in Canada. Elsewhere, especially in Europe, the export company has done useful work in preparation for the possible development of the Common Market and Free Trade Area. The cost of research work in connection with nuclear power development is very high, but the company has been able to meet outlays from its own resources.

Gross work in hand at January 31, 1958, amounted to £22,900,000, an increase of £6,000,000, and group trading profits of £1,757,581 (£1,466,921) created a record. The 17½ per cent. dividend on larger capital represents a 2½ per cent. increase.

New Oxford College Project

Leading industrial firms have undertaken to contribute over £600,000 to the new college at Oxford, the total cost of which will be in the region of £2,350,000. The new college, which is for men, will be called St. Catherine's and the present St. Catherine's Society—from which undergraduates will be transferred to the new college—is to be refounded as a post-graduate centre under a new name.

St. Catherine's will be Oxford's contribution to the provision of more scientists, mathematicians, and engineers. Half of the 400 places will be allocated to students reading for scientific degrees.

The companies which have promised to contribute include:—Esso Petroleum Company, Limited; Shell Petroleum Company, Limited; British Petroleum Chemicals, Limited; Mobil Oil Company, Limited; General Electric Company, Limited; Associated Electrical Industries, Limited; Mullard, Limited; English Electric Company, Limited; United Steel Companies, Limited; Imperial Chemical Industries, Limited; Mond Nickel Company, Limited; Albright & Wilson, Limited; Metal Box Company, Limited; Hawker-Siddeley Group, Limited; Tube Investments, Limited; C. & A. Parsons, Limited, and the Dunlop Rubber Company, Limited.

Chemistry Research, 1957

The Chemistry Research Board, in its annual report* for 1957, recently published, urges an expansion of the present programme of inorganic chemistry, particularly for research on high-purity materials. The report recommends that plans for the next five-year period (1959-64) should include the provision of buildings, equipment and staff for greater effort in these and other directions.

Last year saw the establishment of a new unit at Harwell under the director of the Chemical Research Laboratory, to collaborate with the United Kingdom Atomic Energy Authority in the study of possible applications of radio-active isotopes. This research will be carried out with particular regard to the applications of isotopes to the work of other Department of Scientific and Industrial Research laboratories and of the grant-aided research associations.

The occupation of the laboratories at Harwell began in October last year, and a preliminary survey of the problems awaiting attack has already been completed. The Atomic Energy Authority asked that the programme carried out for it on the extraction of radio-active elements from minerals and ores should be extended, and to this end the Authority agreed to extend the radiochemical building and to increase the number of staff engaged on its behalf.

LIKELIHOOD THAT THE THIRD QUARTER of this year would mark the end of the recession in the steel market was forecast by M. Roger Reynaud, a member of the High Authority, addressing the consultative committee of the European Coal and Steel Community recently. He noted various favourable factors—the uninterrupted improvement in real consumption of steel, a revival in orders from non-community countries in the Benelux market (harder hit than other ECSC countries by the recession), and the cessation of the fall in international prices.

* *Chemistry Research*, 1957, the annual report of the Chemical Research Laboratory, Teddington, is published for DSIR by Her Majesty's Stationery Office, York House, Kingsway, London, W.C.2, price 5s. 6d., post free.

Census of Production for Iron Foundries, 1954*

By Philip Moore, B.Com., M.A.†

For many industries the "Census" forms the basic source of reference, giving the final judgment on employment, the value and volume of output, the raw materials used, the labour and other costs incurred, the size of the firms in the industry, the type of products made and many other matters which closely interest those responsible for the development and progress of the industry and those whose welfare depends either directly or indirectly on it. In the case of iron foundries, however, the Census is only a subsidiary and largely complementary source of reference, the basic sources being the statistics collected by the Iron and Steel Board (formerly by the Ministry of Fuel and Power). These statistics cover the industry under a much wider and more generally acceptable definition than must necessarily be adopted by the Census. In what follows some of the more important information in the Census report is used as a basis for estimating the corresponding statistics for the industry as a whole.

The statistics of the 1954 Census of Production for Iron Foundries exclude any detailed analysis for very small foundries and perhaps most important exclude nearly all "tied" foundries. The consequent limited coverage given to the industry is demonstrated in Table 1. The figures given show certain principal statistics as given in the Census while the corresponding figures relating to the whole industry as covered by the Iron and Steel Board Register of Ironfoundries are shown for comparison. The last column gives comparable statistics in 1957 for the whole industry.

TABLE 1.—*Coverage of the 1954 Census—Census Statistics and Statistics for the Foundry Industry Compared.*

—	1954.		1957.
	Statistics for the industry as covered in the Census.	Statistics for the whole industry.	Statistics for the whole industry.
Total numbers employed Thousands	105.4	140.4(*a*)	138.1(*a*)
Total number of establishments (foundries)	1,050	1,799	1,673
Total number of establishments employing 10 or more persons	838	1,463 (Sept. '53)	1,391 (June '56)
Production in 1,000 tons	2,688(*c*)	3,742	3,715
Capital expenditure £ million	4.3	6.3(*b*)	16.3(*b*)

KEY: (*a*) Annual coverage. (*b*) These estimates derive from a special enquiry carried out by the Iron and Steel Board. (*c*) Sales.

It would appear from these statistics that by numbers employed the Census relates to no more than three quarters of the industry and by number of establishments to less than two thirds. Despite its limitations the Census provides the only basic source of information with regard to total foundry costs, certain aspects of the industry's structure and perhaps most important of all the value of ironfounding production. The problem which arises in using this information is to relate it to the whole industry not simply to three quarters or two thirds of it. In an attempt to solve this problem certain rather arbitrary assumptions must be made and these can be expected to give rise to margins of error. The alternative to this is to leave the Census statistics unchanged but the penalty for doing so is that the information in the Census would remain largely unused and unusable since it would have no significance in relation to the full statistics of, for example, raw materials, and output which are currently made available by the Joint Iron Council.

Throughout the post-war years the ironfounding industry has been seriously hampered by a continuous and steep rise in the prices of its raw materials while to almost the same extent the rise in wages has posed a difficult problem. Just how important these two elements of costs are is indicated by the analysis of foundry costs in 1954 given in Table 2.

TABLE 2.—1954 *Foundry Costs as Percentage of the Value of Production.*

—	Per cent.
Wages and salaries:	
Operatives	28 (average earnings per employee per annum = £486)
Others (includes administrative, technical supervisory staff and working proprietors)	6 (average earnings per employee per annum = £601)
	34 (average earnings per employee per annum = £500)
Materials and fuel	44
Transport	3
Other costs (including depreciation and profits)	19
	100

It is difficult to say how far this analysis of foundry costs can be regarded as fully valid for the whole industry. Cost structures will of course differ widely from foundry to foundry, depending on the type of casting being made and on other factors, but it must also be remembered that the Census Cost Statistics on which Table 2 is based excludes very small foundries and also many tied foundries. It is possible that the inclusion of statistics for these foundries would lead to some modification of Table 2. Perhaps more relevant is the question of how far the 1954 cost structure can be assumed to be valid for 1957. Unfortunately

* Report on the Census of Production for 1954—vol. 3. Industry C—Ironfoundries, published by Her Majesty's Stationery Office, price 1s. 9d. net.

† The Author is economics and statistics officer to the Joint Iron Council and the Council of Ironfoundry Associations.

Census of Production for Iron Foundries

there is no acceptable statistical method of estimating the 1957 position which would not take so long as itself to be out of date by the time it was completed. One can, however, suggest that on the basis of known cost trends raw material costs may form a greater proportion of total costs in 1957 than in 1954, while " other costs (including depreciation and profits)" probably form a lower proportion.

Size Structure

The size structure of the industry, *i.e.*, the extent to which it is made up of small, medium or large firms and the more important question of whether the larger firm is gaining ground in relation to the smaller, can be answered in outline from the more complete statistics available to the Joint Iron Council. Table 3 is derived from these statistics for the industry as a whole, the corresponding statistics as derived from the Census being shown for comparison in the separate column on the right.

TABLE 3.—*Number of Ironfounding Establishments According to Numbers Employed in Each Establishment.*

Average number employed.	Per cent. of total number of establishments (based on statistics for the whole industry).		Percentage of total number of establishments (based on Census statistics 1954.)
	1953.	1956.	
	Per cent.	Per cent.	Per cent.
0–49 ..	68	64	59
50–99 ..	16	17	17
100–200 ..	12	14	16
200 and over	4	5	8
total ..	100	100	100

It is clear from the Table that between 1953 and 1956 the medium-sized, large and very large foundries were gaining in their relative importance, while the smaller foundry was to some extent losing. A comparison of the statistics derived from the figures relating to the whole industry with those based on the Census indicates quite clearly that the Census-based statistics are biased in such a way as to over emphasize the relative importance of the larger establishment. This bias could be partly explained in two ways.

First, the full Census questionnaire was only circulated to foundries employing 10 or more workers and although a very much shortened form of questionnaire was sent to foundries employing less than this number it may be that the coverage of, or response to, this simplified questionnaire was imperfect. Second, the fact that the Census excludes certain tied foundries inevitably means that bias will result in so far as the size structure of tied foundries differs from that of " free foundries." It is not possible to say how far the bias shown by the Census Statistics is attributable to the one or the other of these two factors but its existence does justify us in rejecting the Census Statistics in this context.

There are, however, other measures of foundry size besides the simple statistics of number of firms employing specified ranges of employees. Statistics showing the proportion of the total value of output provided by the different foundry size groups and the value added to production, *i.e.*, price less raw material and transport costs, have their only course in the Census report. These statistics after adjusting for the bias noted above are used as the basis for the statistics in Table 4.

TABLE 4.—*Analysis of the Ironfounding Industry According to Numbers Employed in Different Establishments*, 1954.

Average numbers employed in different establishments.	Number employed as per cent. of total labour force in the industry.	Value of production as per cent. of total value of the industry's output.	Value of net output per person employed.
	Per cent.	Per cent.	£
0–49 ..	18	13	659
50–99 ..	15	12	697
100–299 ..	28	27	736
300 and over	39	48	811
Total ..	100	100	756

The statistics in this Table reveal much about the structure of the industry in 1954. Perhaps the first point that calls for comment is the difference between the large and small firm in apparent productivity. The smaller firm while employing some 18 per cent. of the labour force contributed only 13 per cent., by value, of the industry's total output. The words " apparent productivity " are used advisedly in this context for it must be remembered that the smaller firm is often concentrating on a type of output demanding a high labour content while the larger is often engaged on highly-mechanized long output runs where the labour content by the very nature of the production process will be relatively low. The figures in Table 4 itself then do not allow one to draw any firm conclusions between the relative efficiency of small and large firms.

Output Per Person

Care in interpretation must also be taken when considering the column indicating the net output per person employed. The net output or " Value added," as it is sometimes called, seeks to measure the true contribution of an industry to the wealth of the whole economy. In order to do this the contribution of other industries to the final value of output must be deducted. Put quite simply, the value of the ironfounding industry's contribution to the wealth of the UK can be measured by deducting the costs of raw materials and services such as transport provided by other industries from the final sales value of the finished castings. The resulting figure of net value can then be expressed as is done in Table 4, as a value per person employed.

From the Table it appears that the contribution made to the nation's wealth, the value of net output, by the smaller foundry, was only £659 per employee, against £811 per employee in the very large foundries. The conclusion from this that even disregarding size the larger foundry was a greater national asset than the smaller foundry would, however, be unjustifiable. The larger foundry very often uses more capital per unit of output than the smaller foundry and thus its higher net output is partly attributable to the expense of additional de-

preciation and interest charges which have to be met out of the net output value.

The statistics relating to ironfoundry structure have been considered at length mainly because of the obvious risk of misinterpreting them. It is only too easy to conclude from the Census that a case is made against the smaller foundry. While it *may* be that on balance the smaller unit is less economic yet the statistics produced by the Census are in no way adequate to prove this. Furthermore, even where a specific type of casting may be more cheaply produced in a large foundry it is not necessarily more economic that it should in fact be produced by that large foundry. Where time, coupled with a limited demand, are important factors the small foundry often performs a vital service.

Looking beyond the Census year (1954) one can say little with certainty about subsequent changes in the relative value of production by the different size groups within the industry. It is probable, however, that the relative value of output has to some extent changed sympathetically with the change in the distribution of manpower between different sizes of establishments and there are full statistics to draw upon in relation to this.

As shown in Table 4, in 1954 18 per cent. of foundry labour force was employed in establishments employing under 50 workers. This percentage fell to 16 per cent. in 1957. In contrast to this there was little or no change in the proportion of the labour force employed by the medium-sized foundries (those employing between 50 and 100 employees) while in the case of the larger and very large establishments (those employing 100 or more workers) the proportion of the total labour force employed by then rose by 2 per cent.

To sum up, what has been said with regard to foundry-size structure it can be asserted that in 1957 there were fewer small foundries and that these foundries employed a lower proportion of the industry's total labour force than in 1954; though how far their contribution to the relative value of total foundry output had declined is not known. Post-war economic development in many industries has been in the direction of a relative increase in the importance of the large production unit. In the case of the ironfounding industry, this increase has been taking place at an accelerated rate over the last two or three years and there can be little doubt that the larger unit has gained an importance absolutely as well as relatively.

Value of Output

It is probably correct to say that for most people the centre of interest in the Census report is in the statistics value of output. Up to date, statistics of the output of the industry by weight are made available in detail by the Joint Iron Council but these statistics necessarily give no indication of the relative values of the different types of castings produced. However, estimates at constant (1954) prices of the values of the different types of castings can be made by using these two sources—the Census statistics and the Joint Iron Council's tonnage statistics. These estimates for the main sections of the industry are shown in the Table 5.

Before discussing the information in this Table, it is as well to ask how reliable the estimates may be. The method used in making the estimates can be checked by an alternative estimating procedure based on numbers employed. Using this method the value of production in 1954 would appear to be £205 million compared with £225.6 million as shown in Table 5. There are reasons for supposing that a rather low estimate would result from the alternative method of estimating and on this assumption it might be suggested that the estimate given in Table 5 could be taken as a reasonable basic estimate liable to a maximum margin of error of say 9 per cent.

The statistics giving the value of output tend to correct certain rather misleading impressions, regarding the relative importance of certain sections of the industry, which derive from close attention only to the regularly published statistics of output by weight. Although the iron, steel and coal industries in 1957 consumed nearly 16 per cent.—three-quarters of this being in the form of ingot moulds—of the total castings output by weight, these same industries accounted for only 10 per cent. of the industry's output by value. Similarly in the case of pressure pipes, output by weight is 14 per cent., while by value it is 9 per cent. Railway equipment accounting for 9 per cent. of the weight of output accounted for only 4 per cent. by value.

On the other side are the castings groups showing a high value to weight ratio. The consumer's durable

(*Continued overleaf, column two*)

TABLE 5.—*Estimated Value of Ironfounding Production According to Main Industrial Sections.*

Industrial section.	Per cent. of total value in 1954.	£ million at constant (1954) prices.				Per cent. of total value in 1957.
		1954.	1955.	1956.	1957.	
		£m.	£m.	£m.	£m.	
Automobile (including tractors)	14.8	33.5	39.3	33.7	37.7	17.2
Iron, steel and coal industries (including ingot moulds. Excluding rolls for metal-rolling mills)	7.5	16.9	17.9	20.3	20.9	9.5
Pressure pipes and fittings	12.1	27.2	26.9	26.2	20.3	9.2
Building industry	11.4	25.9	27.5	27.9	28.5	13.0
Marine and other mainly heavy engineering industries	11.9	27.0	28.1	28.8	26.3	12.0
Machinery, machine tools and other general and electrical engineering industries	16.8	37.6	42.4	43.6	41.9	19.1
Railway equipment industries	3.4	7.7	7.3	8.0	8.8	4.0
Consumers durable goods industries (stoves, ranges, refrigerators, etc.)	9.4	21.1	19.3	15.2	13.5	6.2
Unclassified castings (including rolls and valves)	12.7	28.7	30.5	26.6	21.4	9.8
Total	100.0	225.6	239.2	230.3	219.3	100.0

Notes from the Branches

London

Over 40 members of the London branch of the Institute of British Foundrymen spent a very enjoyable day on July 2, visiting the works of British Moulding Machines, Limited, at Faversham, Kent. A wet start was made by the coach party leaving from Charing Cross, but by the time Kent was reached sunshine appeared and for the rest of the day, including the return trip in the evening, the weather was extremely pleasant, well showing off the scenic attractions of this corner of the garden of England. After light refreshments on arrival, the party (reinforced by a few travelling "under their own steam") was welcomed by Mr. V. Cashmore, the BMM's managing director, and then were entertained to luncheon by the firm at the Ship Hotel. Back to their "meat," members split into about half-a-dozen parties, with guides for each, and over two hours were well spent in touring the various departments, including the firm's extremely well-kept foundry. Such items as the use of CO_2-block assembly methods for making aluminium moulding boxes of varying sizes from a single set of pattern equipment caught attention here, in addition, of course, to demonstrations of the firm's moulding machines, of which there was an imposing array. Of considerable interest to the visitors was the printing department, where all the firm's brochures, leaflets, stationery, etc., is printed including work in colour of excellent quality.

In another section members were impressed by the elaborate use made of mechanical tabulating, accounting and other general office drawing-office equipment, including photography. The works record system also came in for much enviable comment. During tea, at the conclusion of the tours, Mr. D. E. B. Barnard, president, expressed the grateful appreciation of the visitors to Mr. Cashmore, Mr. H. J. Bullock (who had made most of the local arrangements), Mr. Doyle who is in charge of the foundry and their colleagues. Each visitor took home with him a basket of local-grown cherries—a gift from the company—and doubtless these proved very useful when members were explaining the late return to their wives.

THE PORT of the Tees has shared in the general shrinkage of Britain's export trade. In the seven months ended May 31 exports fell to 870,961 tons, compared with 1,033,747 tons in the corresponding period a year ago. Imports, however, increased from 2,857,029 to 3,215,888 tons, due mainly to heavier ore imports.

Census of Production for Iron Foundries

(Continued from page 75)

goods industries absorbing only 3 per cent. of the industry's output by weight, accounted for 6 per cent. of the value of production. Similar though less marked differences are shown in the engineering and automobile sections. The rather poor trading conditions that obtained in 1957, however, did not on balance discriminate between the high value to weight and low value to weight sections and output by weight and by value in 1957 would appear to be some 5 per cent. lower than in 1956. In the high value to weight sections the improvement in automobile output served to counterbalance the rather depressed conditions in the consumer's durable-goods and engineering industries. At the same time in the low value to weight sections the improvement in building and railway equipment demand partly offset the reduced output of pressure pipes.

Group of IBF London branch members photographed in front of the British Moulding Machine Company's offices in Faversham, Kent, following a tour of the works. In the centre (front row) is Mr. D. E. B. Barnard, the branch president, with Mr. V. Cashmore and Mr. H. J. Bullock, BMM directors, on his right and left respectively; Mr. Doyle—who has charge of the BMM foundry—is on Mr. Bullock's right.

"Gateway to the Future"

Samuel Osborn's Facilities for Precision Casting

(Continued from page 52)

In the first part of this comprehensive article on the new precision-casting foundry of Samuel Osborn & Company, Limited, at Holbrook, near Sheffield, the general layout and production "routing" system of the works were dealt with, and a number of factual case-histories were presented. In what follows, an assessment of the importance of the new venture is linked with an illustrated account of the wide range of precision castings with which the factory has already been concerned. These include orders fulfilled by the shell-moulding, Osborn/Shaw and CO_2 processes, and by combinations such as the use of Osborn/Shaw cores with CO_2 moulds.

In a project such as that which Samuel Osborn & Company, Limited, have launched at their new Holbrook precision-casting works a close and continued contact with customers is of prime importance. The customer submits his order for estimate; the company consider in detail the most practical and economic method of manufacture open to them and this, with any modifications which it may entail in original specification, they present to the potential customer. To demonstrate the soundness and practicability of their—the "Osborn" way—of doing a particular job the fullest liaison between the two parties concerned is essential to yield the greatest benefit to both.

Generally speaking, as stated earlier, the customer will require particular accuracy at certain points of his casting. When the draughtsman comes to interpret this, he may produce a design which, while it meets the requirements in question, is not ideally suitable from the point of view of "castability." Viewing his design as a potential casting, modifications and alterations making for a better job may occur to the founder and these can be put forward for consideration at an early stage of the proceedings. It is for this reason that Samuel Osborn at Eckington place so great a stress on the need for full technical liaison between their customers and themselves. By suggestions for modifications of this kind, economies can be effected for both parties. Again, liaison is imperative where the customer wishes to impose conditions of secrecy on the order. Incidentally, the company's long history as tool-making specialists gives it a background of experience from which to speak when advice is needed on speeds and feeds for machining—an experience of double potential when putting forward castings. If a customer complains of difficulty in machining, Osborn's can say how the job can be done; if he says, "Can I machine this or that metal at speed," Osborn's have a technical service available to cover just that point.

"Let us be Practical"

The customer fixes the standard of inspection to be imposed. If this were not known at the outset there would be a danger that the company might "set its sights" unnecessarily high in this respect. In the preliminary consultations, however, the customer is encouraged to align his requirements with the practical purpose of the casting rather than with "ideal" test-bar specifications.

As the three processes are all "neighbours," as it were, at the Holbrook foundry, personnel can be re-allocated, without great difficulty, and internal liaison is easily effected by reciprocal visits among the various departments. As regards staff, the company has adopted the principle of "new men for new methods," preferring, broadly speaking, to recruit and train rather than to transfer and re-train personnel. The relatively low proportion of female employees (about 10 per cent.) at the Holbrook works is employed mainly in the Osborn/Shaw moulding department.

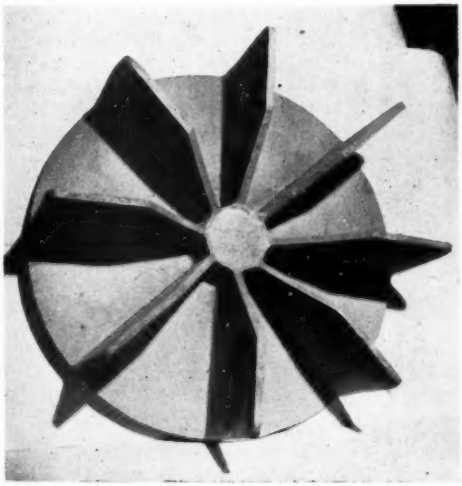


FIG. 6.—*Impellor for tempering furnaces, made by combined Osborn/Shaw and CO_2 processes—Osborn/Shaw cores and CO_2 mould. The impellor is 18-in. dia. and weighs 65½ lb.*

Future

As has already been mentioned, the Holbrook

Osborn's Facilities for Precision Casting

foundry has been built—with ample room for expansion—on an industrial housing estate. It is hoped, therefore, to recruit the nucleus of trained staff from the nearer side of Sheffield and to house them in the immediate vicinity of the foundry. It is interesting to note in this connection that as an industrial estate this should be fairly typical of many others in the area inasmuch as it is grouped not around heavy industrial works (as originally envisaged by the planners), but around the factories of specialist manufacturers and precision engineers. For the future, of course, it is obvious that a move out to Holbrook of other departments of the Osborn group of companies is envisaged, and indeed, the layout of the works has been decided upon with

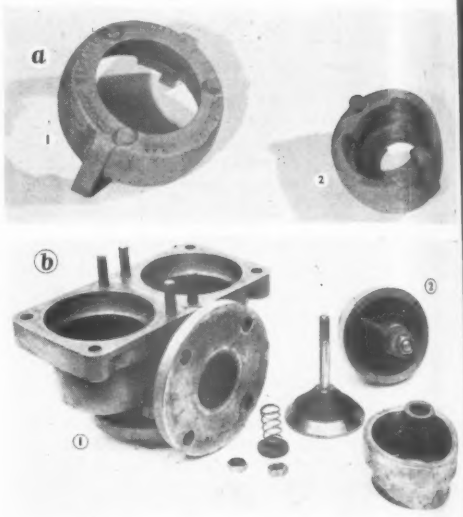
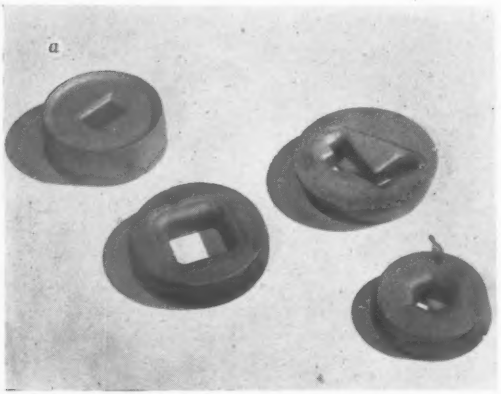
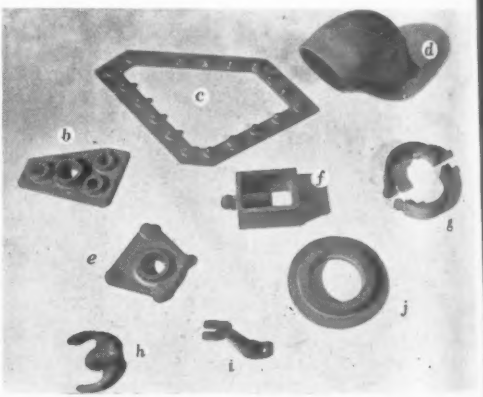
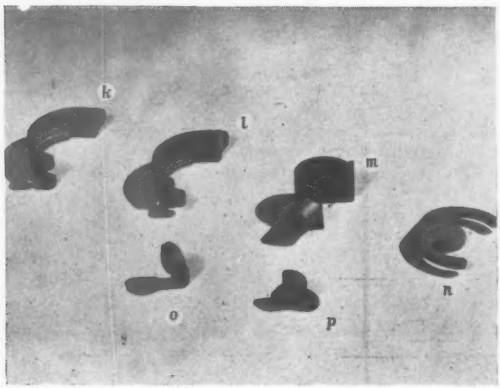


FIG. 8.—*CO_2-process castings*—(*a*) 4-*in.* (*1*) *and* 2-*in.* (*2*) *lug rings* (*descaling equipment*); (*b*)(*1*) *valve box;* (*2*) *valves* (*pump industry*).







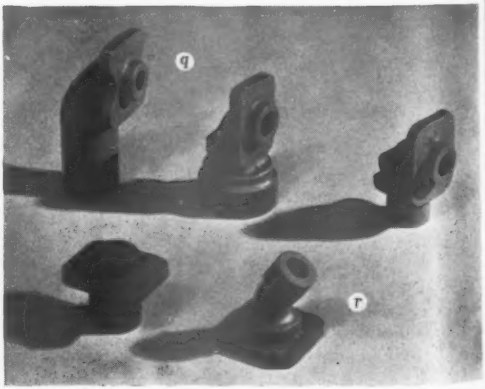
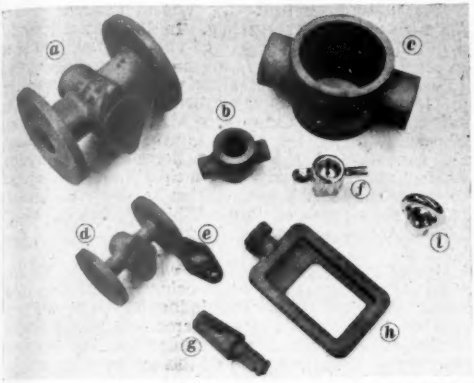
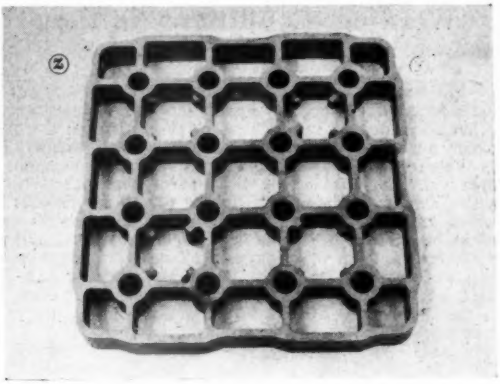
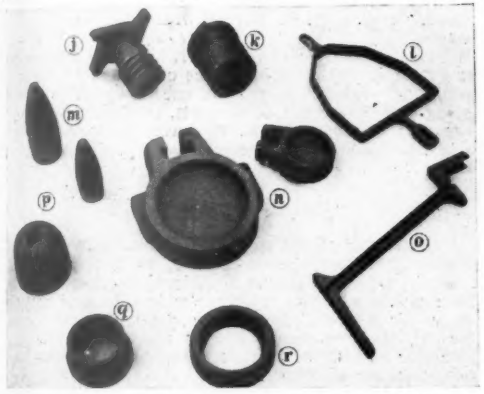


FIG. 7.—*Osborn/Shaw castings*—(*a*) *hot-extrusion dies;* (*b*) *union-nut plate;* (*c*) *access door;* (*d*) *elbow;* (*e*) *gear-housing cover;* (*f*) *single-bracket roller wedge;* (*g*) *pipe clamps;* (*h*) 2½-*oz. cluster hook;* (*i*) 3-*oz. speed lever;* (*j*) *sump mounting-plate;* (*k*) 4¼-*oz. half clamp;* (*l*) 4½-*oz. half clamp;* (*m*) *pipe hanger;* (*n*) 2⅝-*in. cluster hook;* (*o*) *lever shank;* (*p*) *foot for lid-handle; aircraft components*—(*q*) *outlet and inlet connections;* (*r*) *flanged breather-unit.*







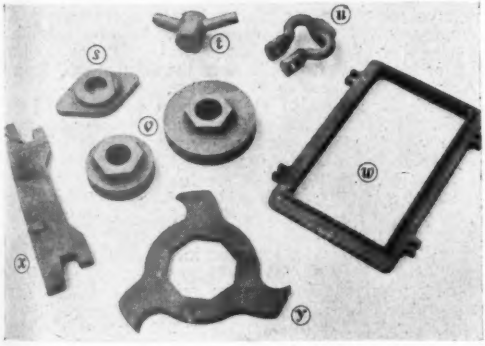


FIG. 9.—*Castings made by the shell-moulding process—(a) valve body (size 2 in., 8½ in. over flanges, weight 20½ lb.); (b) drain-cock body (size ¾ in.); (c) two-way cock body (3 in.); (d) valve body (size ½ in., weight 4¼ lb.); (e) packing gland; (f) crab-claw body; (g) cock plug; (h) valve-body inlet; (i) eyebolt; (j) screw; (k) barrel; (l) stirrup bracket; (m) piercer points; (n) valve wedges (3¼ in. dia., weight 4 lb.); (o) counter bracket; (p) pug-mill plug (3⅞ in. dia., weight (8¼ lb.); (q) coupling rail; (r) lug nut; (s) packing gland; (t) nut for latch bolt; (u) connecting link; (v) top caps for cock bodies; (w) hopper frame; (x) fire-bar (11¾ in. long, 4¼ lb.); (y) masticater knife; (z) furnace tray, weight 52 lb. This last is the largest casting made to date at Holbrook.*

THE FIRST of three 50-ton capacity vessels required for the new basic Bessemer steelmaking plant, at present under construction at Abbey Works, has arrived at Port Talbot in the M.V. Milo. Weighing more than 50 tons and measuring nearly 29-ft. long by 19 ft. dia., it was supplied from the Demag Works at Duisburg, Germany. When completed the Bessemer shop will include three 50-ton capacity converters with provisions for a fourth in the future. It is reported that it will be the first plant in Britain to use converters of this size and the first in the world to operate them using oxygen steam blast only. When in operation the plant will produce 12,000 tons of deep-drawing steel per week.

this end in view—hence, the double meaning of the title of this article, "Gateway to the Future."

Acknowledgments

In conclusion, thanks are due to Mr. John Osborn, Mr. R. F. Horton, as well as to other directors of the Osborn group of companies for permission to publish this intimate account of their operations at Eckington, and the staff for assistance in its compilation. In particular, the writer would like to lay stress on the publication of "case-histories," never before made so freely available. Castings of high precision—and high value—will in the future attract more and more the "cream" of orders from the engineering industry and Osborn's are to be congratulated on seizing upon this state of affairs for their own benefit and on spreading the news of their progress for the benefit of fellow founders.

HEENAN & FROUDE, LIMITED, of Worcester, are to supply a tyre test plant to the North British Rubber Company of Edinburgh. The plant is designed for testing two tyres simultaneously, pressing them into contact (by means of a mechanical lever and weight system), with a rotating drum. An almost identical plant has been ordered from the same company by Francis Shaw, Limited, of Manchester, as part of a consignment of tyre-making equipment for Yugoslavia.

D

Working Conditions in the Nineteenth Century

By T. R. Harris

Students of engineering history and technology are often conscious of the lack of original material from which an idea of the conditions prevailing in industry in the early stages of the Industrial Revolution can be obtained. This is largely because of the successive salvage drives claiming most of the day-to-day records which were considered to be of no further use to a business. Thus large numbers of cash, wages, and stock books, from which valuable data could now be obtained were irretrievably lost. Fortunately, however, a few were overlooked and from one set of these glimpses can be caught of an early nineteenth-century foundry situated at Hayle, Cornwall.

In 1841, N. O. Harvey, the engineering partner of the firm, gave evidence before a Royal Commission enquiring into the employment of women and children in industry. From the subsequent Report it is learnt that at the foundry the number of employees fluctuated considerably. It was said that the numbers employed were "as great about 1824 as at any-time." The greater part of the work was done as piece work, being set to a party, but the management fixed the wages of those under them. Apprentice boys of 14 were paid 4d. a day and their wages were gradually raised to 2s. up to the age of 21. Tradesmen earned from 15s. to 18s. per week on the average. When work was brisk some of them received £2 or £3 a week by the piece.

Wages were paid once a fortnight, and an entry in a wages book, dated September 29, 1838, records that James Wearne and Richard Blight received £8 15s. 0d. for "making pattern of a main beam for 90-in. engine." Then on May 25, 1839, H. Hosking and T. Smitheram were paid £1 for "preparing sweeps and fixing them and making a template of a 94-in. cylinder."

The cash book is perhaps of even greater interest than the wages book. The frequent reference in this volume to "Allowances" throw considerable light on the customs of the period and on the work produced. Some of the allowances were periodical such as at Christmas, Easter and Midsummer, but others were for specific work. Although invariably the entry is for cash, it is more than probable that the amount entered was that spent in liquid refreshment. An entry on June 2, 1828, "Paid Mrs. Trevithick allowance to the foundrymen on castings for Penryn Bridge 6s. 3d." suggests this. Mrs. Trevithick, the landlady of the hotel adjacent to the foundry, was the wife of the celebrated engineer, Richard Trevithick, and sister of the proprietor of the factory.

Much of the work in this foundry was hot and heavy thus the allowances to foundrymen are frequent. The following extracts illustrate the type of work that qualified for this extra remuneration. In April, 1827, "Founder's allowance for casting Bell—5s.; ditto casting a 70 in. cylinder—5s.; men getting cylinder out of pit 2s.," is recorded. Occasionally there are allowances for "moulders working by night," and "moulders working on Sunday." From some of these entries a picture can be obtained of the output over a period. For example in March, 1837, an allowance of £4 17s. 0d. was paid. This covered the period October 10, 1836, to March 4, 1837, when 10s. was paid for each cylinder above 50-in. diameter, 7s. for bobs (large open sand castings sometimes called beams) of engines over 50-in. diameter cylinder and 5s. for each cylinder under 50-in. diameter with a like sum for their bobs. The allowance was made up of 5 cylinders at 10s., 7 at 5s., one bob at 7s. and one at 5s.

The midsummer allowance was at the rate of 6d. for a man and 3d. for a boy. In 1838 there were 51 men designated "moulders and chippers" and 30 boys in receipt of this. The number of patternmakers was 12 men and 7 boys. During the Crimean War the moulders sacrificed some of their privileges, a note in the cash book for October, 1854, records "Moulders allowance given by them to the Patriotic Fund £11 14s. 4d." A sidelight on the close co-operation which existed between the principal foundries in the county at that time is caught from an entry in January, 1836, "Paid expenses at the White Hart with Men." "Pool, Wilson and others fixing price of castings, etc., 14s."

During the expansion of the works in the 'forties, when large contracts were being undertaken and labour recruited from the industrial parts of the country, there was a slight undercurrent which tended to disturb the cordial relationships existing between master and men. An echo of this is found in a copy of a letter in a duplicate letter-book which has survived. In this, N. O. Harvey wrote, when submitting an estimate to the Manchester and Salford Water Works Company in December, 1845, "We ask for an extension of time in consequence of a great excitement with our workmen at present, caused chiefly by men being sent here from other parts, to induce them by promises of higher wages to leave our employ and also by attempting to get them to join the Trades Union."

Wages and Hours

The twelfth edition of "Time Rates of Wages and Hours of Labour," dated April 1, 1958, compiled by the Ministry of Labour and National Service, has now been published. The main tables in this new edition show, for the majority of industries and occupations, the minimum or standard, time rates of wages, the dates from which these rates became operative, and the normal hours of labour.

The rates of wages and hours are those determined by voluntary agreements between organizations of employers and workpeople, or made by joint industrial councils or other similar bodies, or by Statutory Orders under the Wages Councils Acts, the Agricultural Wages Acts and the Catering Wages Act.

Particulars are also given, where available, of the basic rates for pieceworkers, the additional rates payable to shift and night workers, and, where they are known to exist, of the arrangements for a guaranteed weekly wage or period of employment.

Three appendices give details of rates of wages for young workers in a selection of industries, and of overtime rates of pay, and arrangements for paid holidays in the industries included in the main part of the volume.

In general the information relates to the position as at April 1, 1958, but subsequent changes in rates of wages that were known before the final proofs were sent to press have been incorporated. Particulars of changes in rates of wages and hours of labour are published monthly in the Ministry of Labour *Gazette* and the data given in the new edition can be kept up to date by reference to this current source of information.

AN ORDER for 48 diesel cars and trailers has been placed with the Pressed Steel Company, Limited, Oxford, by the British Transport Commission. Most of the cars are intended to form the first multiple-unit diesel trains to operate in the west of England; the remainder will be used as single units or with trailer cars.

ISO Harrogate Meetings

Extracts from committee reports indicate some progress towards international standards applying to the foundry and kindred industries

The fourth plenary session of the ISO—International Organization for Standardization—brought to the town of Harrogate nearly 1,000 delegates, each an expert in his own field, from almost every country which engages in foreign trade. To say that this series of meetings—held for a full fortnight from June 9 to 21—was successful is something of an understatement. Underlying this gathering of the nations was a spirit of co-operation —an urge to agree—which was perhaps unique in international conferences directed to general subjects. All 15 of the technical committees meeting at Harrogate had successes to report and an impressive number of "recommendations"—which are, in effect, international standards—were brought to completion or near-completion. Those relating to the foundry and kindred industries are related in what follows:—

"Break Down the Barriers"

ISO-Harrogate-1958 was opened on June 9 by its President, Sir Roger Duncalfe, at the conference headquarters in the Royal Hall, Harrogate. He told the several hundred delegates from 37 countries:

"Probably we should all agree that a peaceful future for our civilization and a greater measure of happiness for all mankind depend more upon a steady rate of economic growth and a continuing expansion of world trade than on any other factor. So we must break down the barriers to that expansion."

Delegates from the United Kingdom numbered close on 150 and included leading figures from those industries with a direct interest in the committees meeting at Harrogate. This powerful support in the form of direct participation in the discussions was, moreover, re-inforced by the generous financial support of British industry as a whole.

The delegations from other countries were also both large and of high calibre. There were more than 100 representatives from France, 70 from Germany, 50 from Italy; no fewer than 60 from the United States of America and there were 30 Russian representatives. It was specially encouraging to have visitors from some of the smaller countries which are still at an early stage in developing their industries—from Burma, Turkey and Mexico for example.

Technical Reports

Steel—High-temperature Tests Agreed

Sixty delegates from 23 countries attended the meeting of technical committee 17, steel. In the chair was Mr. E. W. Senior, commercial director of the British Iron and Steel Federation. Delegates agreed on four proposed methods for the high-temperature testing of steel—a significant advance which will be welcomed by those sections of industry concerned with the production and export of high-temperature and high-pressure apparatus operating at temperatures up to 1,000 deg. C.

The committee's future programme will include —in addition to establishing further test methods—

The accompanying illustration shows the British delegation in the meeting of ISO Committee TC25—Cast Iron. This meeting was held between June 16 and 19 in Harrogate during the fourth general assembly of the International Organization for Standardization.

From left to right: Mr. S. H. Smith (I.C.I.); Mr. E. M. Currie (International Mechanite Metal Company, Limited); Mr. P. A. Russell (S. Russell & Sons, Limited); Dr. H. T. Angus (British Cast Iron Research Association), and Dr. A. B. Everest (Mond Nickel Company, Limited).

ISO Harrogate Meetings

consideration of international specifications for the materials themselves.

Copper—Three Recommendations

Technical committee 26, copper and copper alloys, held its second meeting in Harrogate under the chairmanship of Mr. Gordon Weston, technical director of BSI. Forty-three delegates from 16 countries conferred for four days on items of mutual interest in the field of standardization. They agreed on three proposed ISO recommendations: (*a*) Methods of test for residual (internal) stresses of copper and copper base alloys (mercurous-nitrate test); (*b*) methods of test for expansion of copper and copper-alloy tubing (pin test); and (*c*) classification of raw copper.

Important progress was made in drawing-up two basic classifications, one for wrought-copper and copper alloys, and the other for cast-copper alloys, which include the chemical composition and mechanical properties of the alloys.

Delegates gave their preliminary approval to a draft specification for electrolytic copper wire bar, cake, slabs, billets, ingots and ingot bars. This specification together with further methods of mechanical test will be sent to the member-countries of this committee for their approval or comment.

The leader of the British delegation at Harrogate was Mr. W. L. Govier of Yorkshire Imperial Metals, Limited, who represents the tube group of the British Non-Ferrous Metals Federation.

Pallets—International Standard for Larger Sizes

Technical committee 51, pallets for unit-load method of materials handling, had already produced one international recommendation covering three sizes of through-transit pallets in sizes 32 by 40 in., 32 by 48 in. and 40 by 48 in. At Harrogate, delegates completed the drafting of a second recommendation for large pallets—48 by 64 in. and 48 by 72 in.

The committee also agreed final amendments to a glossary of terms which will be published in English, French and Russian. Equivalent terms in German (and other languages) will be added if requested. Delegates also agreed on the basis for a recommendation on the testing of timber pallets to ensure their fitness for the job. A new working group will study the testing of metal pallets.

Machine Tools—Test Code Approved

Of far-reaching significance to international trade is the final agreement reached at Harrogate by technical committee 39, machine tools, on requirements for a test code which will become the standard reference for use throughout the world. The value of this code in facilitating exchange of machine tools between one country and another will be extended by the committee's further agreement on ISO recommendations covering lathe centres, tool posts and speeds and feeds for machine tools.

Forty-five delegates from 16 countries met under the chairmanship of Mr. Pierre Salmon, *ingénieur général* at the *Commissariat à la Normalisation*, Paris, who enjoys a world-wide reputation for his work on machine tools. Sir Stanley Rawson, vice-chairman of John Brown and Company led the United Kingdom delegation.

Cast Iron—Tensile and Hardness Testing

The object of technical committee 25, cast iron, is to secure international agreement on standards for foundry pig-iron and cast iron, particular attention being paid to the co-ordination of nomenclature, definitions and methods of test. At Harrogate delegates brought to virtual completion a recommendation on the tensile testing of grey cast iron which will enable manufacturers and users in any part of the world to compare this material on a uniform basis. The committee also reached agreement on a method for testing the hardness of grey cast iron.

A useful preparatory discussion was held on international standards for malleable cast-iron and spheroidal- and nodular-graphite cast iron. It was agreed that work on impact testing being carried out by the International Committee for Testing Cast Iron should be continued.

Because of the indisposition of Dr. J. G. Pearce (director of the British Cast Iron Research Association) the chair was taken by Mr. R. McKinstry of BSI's technical secretariat. A strong British delegation, led by Dr. A. B. Everest of the Mond Nickel Company, joined with representatives from 12 other countries for the Harrogate meetings.

Light Metals—New Recommendations

Technical committee 79, light metals and their alloys, met under the chairmanship of Monsieur J. Duval, technical director of the French Standards Association. This three-year-old committee has, in the interests of easier world trading (chiefly to avoid misconceptions between buyer and seller), sought agreement on chemical composition and mechanical testing of aluminium and magnesium and their alloys. The committee has prepared recommendations relating to magnesium ingots and magnesium-alloy ingots and castings; other recommendations for pure aluminium, aluminium-alloy castings, and tensile and hardness testing of light alloys are also at an advanced stage.

At Harrogate 52 delegates from 14 countries reached agreement on international standards covering: (1) composition of magnesium/zirconium alloy castings; (2) compositions of four additional aluminium-alloy castings; (3) composition of wrought aluminium and aluminium alloys; (4) unalloyed magnesium conventionally defined as 99.95.

Leader of the British delegation at Harrogate was Mr. E. G. Robinson, of the Northern Aluminium Company, Limited.

Certification Marks

Many overseas standards bodies now operate certification marks—similar to BSI's "Kite-mark" scheme—to indicate that a product conforms with national standards. Technical committee 73, "marks indicating conformity with standards," was accordingly set up to investigate the practice of different

countries in this respect with the object of achieving some degree of uniformity in the principles involved. This committee held its fourth meeting at Harrogate, under the chairmanship of Mr. J. Birlé, director-general of the French Standards Association.

The committee agreed on the principles applicable to the operation of marks indicating conformity with standards. This difficult question had been considered by the committee since its first meeting. It will now form the subject of an ISO recommendation to be published in the near future.

The committee examined the question of informative labelling, aiming to give to the consumer useful technical information on the products purchased, by means of appropriate labels. General agreement was reached on the broad principles on which informative labelling should be based.

The committee also considered the possibility for a product made in one country to bear the standards marks of other countries, and it was agreed to study carefully this form of international collaboration.

ISO Council

The ISO Council, which is responsible to member-bodies for the general policy and administration of ISO, held their meetings from June 14 to 17 with Sir Roger Duncalfe in the chair. The Council elected Vice-Admiral George F. Hussey (managing director of the American Standards Association) as vice-president of ISO for a term of three years in succession to Dr. Carlo Rossi (Italy). Dr. Rossi and the treasurer, Mr. W. Ruggaber (Switzerland) who has served the ISO for six years, were thanked by the Council for their notable services.

As part of its general planning of ISO work the Council approved the setting up of a special committee to co-ordinate the mechanical testing of metals. A committee on similar lines recently made recommendations on standard atmospheric conditions for testing.

The Council received reports on the co-operation of ISO with IEC and with other international organizations. Arrangements were approved for liaison between the ISO and organizations of the United Nations, in which international standards problems are increasingly arising.

General Assembly

Representatives of some 35 countries were present for the meetings of ISO's full General Assembly at which Professor E. A. Wegelius (director of Finland's National Research Institute) was elected as ISO's new president; his term of office begins on January 1, 1959. New members of the Council elected by the assembly were Netherlands and Rumania, the USSR being re-elected.

In his address to the assembly, Sir Roger Duncalfe underlined ISO's growing activities. "The striking feature of the technical work," he said, "is the increasing rate at which draft recommendations are coming forward and the need to see that they are transformed with the least possible delay into published recommendations and made available to the industries of the world."

He spoke of the extra responsibilities which this work threw both on the standards organizations of ISO's member-countries and the secretariat in Geneva. The Council had agreed on some measures to speed up the issue of recommendations and would keep a close watch on the position.

The Assembly received a report on the activities of all ISO technical committees and a financial report which showed a satisfactory position.

Mr. H. St. Leger, general secretary of ISO, spoke of his visits to a number of countries in East Europe which were keenly interested in ISO work. Discussion underlined the importance of the help which ISO could give to countries developing their industrial techniques. More thought will be given to this and to the representation of such countries in the counsels of ISO.

Works Visits

In connection with the conference approximately 24 members of the International Committee ISO/TC 25 "Cast Iron" visited, on June 17, the works of William Asquith, Limited, and Modern Foundries, Limited.

The visitors on arrival at the works of the first-named company, were received by Mr. R. Brothwell, general manager, and Mr. C. Craven, production engineer. The party was then split into two groups and escorted through the light and heavy machine-shops, the heat-treatment department, fitting shops and the tapper production department. During the course of their tour, the visitors saw the machining of many of the heavier types of iron castings, and the assembly of drilling, transfer, and boring machines. Special interest was shown by members in the handling of the larger castings, principally those used for the production of heavy boring machines.

The guests were entertained to luncheon in the canteen, and following the welcome from Mr. G. W. Nicholls and Mr. J. D. H. Horobin (directors), Mr. R. A. McKinstry, senior technical officer of the BSI, expressed on behalf of members their appreciation of the visit, and referred to the high standard of work being carried out in the works.

After luncheon, the works of Modern Foundries, Limited, were visited. Here the party split up into four groups and were conducted round the works by Mr. G. W. Nicholls, Mr. R. L. Simpson, works manager, Mr. D. T. Kershaw, technical manager, and Mr. B. Priestley, assistant technical manager. As the parties proceeded through the various departments, the "guides" explained in detail all the foundry processes, and methods of pattern construction, in particular, the jig setting of patterns for a Jackman moulding machine to enable both halves of a mould to be produced mechanically. The small foundry, the coremaking sections, and the metal-melting department were also visited, and surprise was expressed at the large size of cores manufactured satisfactorily by the CO_2 Process. After witnessing the casting of a large 8-in. boring-machine bed, next on the schedule came the fettling section, and this was followed by inspection of the Birlec mains frequency furnace where the production of high-duty iron from cast-iron borings was demonstrated.

Amongst those participating in the visits were:—

Mr. S. Zachariassen, Norway; Mr. F. Aglave, Belgium; Mr. S. Drapal, Czechoslovakia; Prof. Dr. W. Patterson and Prof. Dr. K. Roesch, Germany; Shri. T. Atkinson, India; Mr. M. A. Arnan, Israel; Mr. C. Galletto, Italy; Mr. V. Pozzesi, Dongo (Como); Mr. J. S. Abconwer, Holland; Mr. J. Wozniacki, Poland; Mr. L. Villner, Sweden; Mr. F. Flubacher, Switzerland; Mr. S. H. Smith, ICI; Mr. E. M. Currie, International Meehanite; Dr. H. T. Angus, British Cast Iron Research Association; Dr. A. B. Everest, Mond Nickel Company; Mr. L. Genié, Yugoslavia, and Mr. R. A. McKinstry and Miss J. Norton, from the British Standards Institution.

First-aid in Factories

In a written answer to a Parliamentary question Mr. Iain Macleod, Minister of Labour and National Service, said that drives were to be made in some 40 towns with the aim of increasing the number of personnel trained in first-aid duties in factories. The towns were to be chosen by the Ministry of Labour in consultation with the St. John Ambulance Association, St. Andrew's Ambulance Association and the British Red Cross Society.

The Report on Industrial Health* based on a survey in Halifax, which was published in March, 1958, drew attention to the unsatisfactory arrangements for first-aid that existed in a considerable number of factories. The Industrial Health Advisory Committee recommended that action designed to improve the situation revealed in the Report should be taken under the following heads:—Advice on methods of treatment as set out in the official leaflet included in first-aid boxes; contents of first-aid boxes; maintenance of the boxes in good order, and training and recruitment of personnel.

The current Frst Aid in Factories Order prescribing the contents of first-aid boxes was made in 1938. The new draft Order and the new draft of the leaflet giving advice on first-aid treatment take account of changes in medical practice in the intervening 20 years. Comments are now being received from interested organizations. The new Order, when made, will apply to some 255,000 premises covered by the Factories Acts.

The basic problem in improving first-aid services in factories is that of increasing the number of persons employed there who have been trained in first-aid treatment and whose training is both adequate and up-to-date. Section 45 of the Factories Act, 1937, lays down that in factories where more than 50 persons are employed, the responsible person in charge of the first-aid box must be trained in first-aid treatment. No definition of the phrase "trained in first-aid treatment" is given in the Act, but the Ministry would regard this condition as satisfied if, for example, the person held a valid certificate issued by the St John Ambulance Association, St. Andrew's Ambulance Association or the British Red Cross Society. To be valid the certificate must normally have been issued within the last three years and in many cases this means that certificates issued some years ago should be replaced by a new certificate after taking a refresher course.

In order to stimulate recruitment and training in first-aid the Ministry has been in consultation with the St. John Ambulance Association, St. Andrew's Ambulance Association and the British Red Cross Society and worked out with them plans for launching a series of local drives to urge firms to review the existing arrangements for first-aid in their factories and to consider whether, to make these adequate, advantage should be taken of the training facilities available in the locality.

It has been decided to make, as an experiment, special approaches to the occupiers of factories employing 50 workers or more in three towns in each of the 14 Divisions of the Factory Inspectorate covering England, Scotland and Wales. In each of the towns selected a letter will be addressed to the management of each firm stressing the importance of having adequate first-aid arrangements in their factory and telling them of the training facilities available in the area.

**Industrial Health—A Survey of Halifax.* A report by H.M. Factory Inspectorate and Recommendations of the Industrial Health Advisory Committee. Published by H.M. Stationery Office; price 1s. 6d. This was the subject of editorial comment in the April 10 issue of the JOURNAL, page 411.

"The Statue that Grew Overnight"

Seventy years ago in 1887, a young journalist by the name of James Barrie had his first book published, a Satire on London life, which was mildly successful. Then, one morning, some 20 years later, in 1912, when the nursery maids brought their young charges to their favourite spot in Kensington Gardens on the south side of the Serpentine, they rubbed their eyes in astonishment. There, before them, stood the bronze statue of a little boy, which was certainly not there the day before. He was blowing a penny whistle and rabbits were gambolling at his feet. The news spread quickly and soon all London was guessing at the mystery. There had been no unveiling ceremony and no announcements had appeared in the Press. Nobody seemed to know how the statue came to be there and at last questions were asked in Parliament. It then came to light that Sir James Barrie, the author of "Peter Pan," had commissioned Sir George Frampton to sculpt "The boy who would not grow up" and, having privately arranged with the Commissioner of Works, had it erected overnight. Sir James paid the entire costs himself, no doubt considering that the resulting publicity would greatly add to the success of his whimsical play which was then running in London and which has enchanted generations of theatregoers ever since. (The illustration appearing on the left was prepared from a comparatively recent photograph of the "Peter Pan" statue).

FIG. 1.—*The well-known bronze statue of Peter Pan which "appeared" overnight in Kensington Gardens, London, in* 1912

Equipment & Supplies

Automatic-camera Microscope

A new automatic-camera microscope—claimed to be the first of its kind in the Midlands—was recently installed at the Sheffield works of Padley and Venables, Limited, makers of engineering tools, and to coincide with the occasion a Press review was held in London at which the new instrument was demonstrated. The unit (Figs. 1 and 2), of which there are only two others, was made by the West German firm of Carl Zeiss. Mr. G. A. Morgan, managing director of Padley and Venables, commenting on the installation, said that it would permit the company to conduct extensive research for the benefit of the British compressed-air industry.

The microscope is known as the "Ultraphot II" and is an automatic camera-microscope suited for visual observation and photography of microscopic and macroscopic specimens. It combines microscope, camera-exposure meter and illumination apparatus and is suited for many kinds of research projects. The optical and mechanical performance of the instrument fulfills exacting requirements. Both bright and dark field methods can be used; also phase contrast with trans-illumination or epi-illumination using polarized or non-polarized light. The apparatus may also be used for microprojection on to ground glass plate.

The photo-head of the camera can be used for taking photographs on plates and cut film. It is the first instrument embodying a photomicrographic camera provided with fully-automatic exposure mechanism. As long as the microscopic image is in focus and the plate slide is pulled out, all that is necessary is to press a single push-button to open the camera shutter. The exposure time is then adjusted automatically to the correct value, depending on the intensity of illumination and speed of film. When the picture is taken the shutter closes itself. The instrument is being marketed in this country by Degenhardt and Company, Limited, 6, Cavendish Square, London, W.1.

FIG. 1.—*New Zeiss automatic-camera microscope, recently installed at the works of Padley & Venables, Sheffield.*

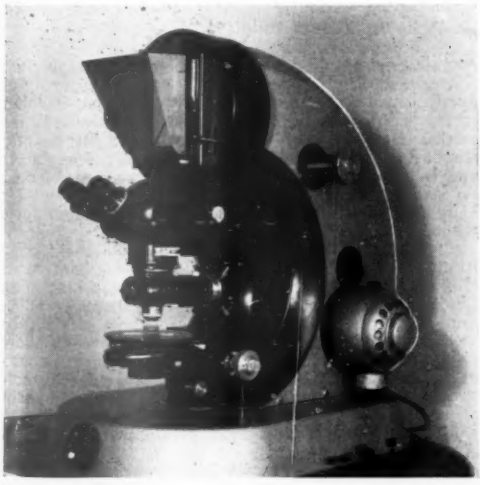
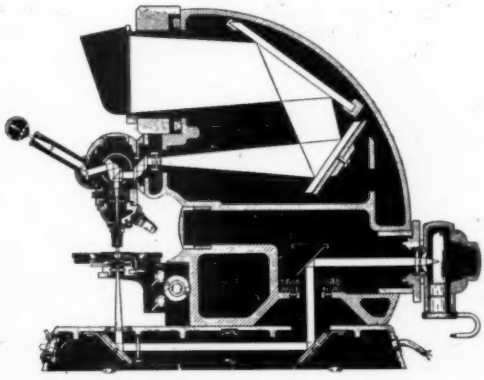


Fig. 3 above shows an Australian foundry where the Schwank gas radiant burners, supplied by Siaps Gas Radiants, Limited, Grand Buildings, Trafalgar Square, W.C.2, are being used for the drying out of moulds. Owing to the very low wave-lengths of the radiant energy, the heat penetrates into the sand and dries very rapidly without cracking the surface. The burners illustrated are running off liquid or propane gas but work equally well on town's gas.

NORTH HILL PLASTICS, LIMITED, of Manley Court, Stoke Newington High Street, London, N.16, are now marketing a new weld-cleaning fluid "pelox" which will be of interest to stainless-steel founders and to those producing cast/weld constructions in that material. The liquid is applied to the discoloured areas and the metal is polished with a rotating stainless-steel brush. The discoloration is thus removed instantly leaving a matt finish. Any residue from the dried-out liquid can be removed with sponge and cold water.

FIG. 2.—*Schematic section of the microscope showing the path of rays in transmitted light.*



News in Brief

LEES HALL & SONS, LIMITED, announce the removal of the head office—but not the works—from Newhaven, Sussex, to 1, Moreland Avenue, Leicester.

THE ANNUAL CONFERENCE of the British Institute of Management is to be held in Brighton from November 26 to 28. Mr. Peter Thorneycroft, M.P., is to open the proceedings.

RESEARCH AND CONTROL INSTRUMENTS, LIMITED, 207, King's Cross Road, London, W.C.1, has been organized to handle and service a number of well-known scientific instruments.

Mr. NORMAN BROWN, first warden of the St. Mary's Community Centre, Sheffield, which was opened two years ago, has been appointed a personnel officer at Laycock Engineering Company, Limited, Sheffield.

SHALLWAY INTERNATIONAL CORPORATION, 1450, West Third Street, Los Angeles 57, California, U.S.A., have been appointed sales agents for the States Engineering Corporation of Fort Wayne, Indiana. The latter firm manufactures a sand-conditioning machine—the Ring-lift.

WORKERS AT NEWTON CHAMBERS & COMPANY, LIMITED, Chapeltown, brought roses to work for the workers' rose show on July 9. Over 100 blooms were on show in the works' welfare hall at lunchtime, and were judged by Mr. J. Watson, parks superintendent to Wortley Rural Council.

AN ELECTRIC FURNACE "backfired" at the works of Edgar Allen & Company, Limited, Attercliffe Common, Sheffield, on July 9. Two men who were charging the furnace with scrap metal at the time, escaped uninjured. Molten metal and scrap steel were flung through the roof and rafters were set on fire.

WITHIN THE NEXT FEW WEEKS negotiations for the now idle Mellingriffith Tin Works are expected to be completed. The tinplate works, absorbed by the Steel Company of Wales, closed last year and a group manufacturing engineering and electrical goods are interested in the site for four other companies.

THE COMMONWEALTH TRANS-ANTARCTIC EXPEDITION discovered some unexposed Kodak film that had been jettisoned by members of the Scott Expedition of 1910. It was brought back to England, tested, and found to be still light-sensitive after 48 years in the polar ice, although it was marked "Develop before May 1, 1911."

THE HONOURABLE RICHARD WOOD, Parliamentary Secretary to the Ministry of Labour and National Service, in a speech at Morley commended the decision of the British Employers' Confederation, the Trades Union Congress, and the boards of the nationalized industries, to establish a national apprenticeship council.

THE ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, London, W.C.2, is again sponsoring an industrial art bursaries competition for 1958, and amongst the bursaries being offered is one for the design of domestic solid-fuel-burning appliances. The prize money for this has been given by the Coal Utilisation Council.

INCREASED financial assistance this autumn for about 2,000 post-graduate science and technology students is announced by the Department of Scientific and Industrial Research. The value of the awards, which will apply to both DSIR research studentships and DSIR advanced course studentships, will be increased by about 10 per cent.

A POSTSCRIPT to the Cleveland Foundry Show appears in *Newsletter*, the house organ of the David Brown group of companies, wherein it is stated that the sand mill exhibited by Foundry Equipment (north America) was equipped with six Radicon worm reduction units of the RHU-type, which were supplied by the Park Works, Penistone.

THE BRITISH TRANSPORT COMMISSION have placed an order with the Pressed Steel Company, Limited, Linwood, Paisley, for 48 diesel cars and trailers. Most of the diesels will go into service in the west of England and will be operated as three-car trains, each with a buffet car. Each of the 32 powered cars will be fitted with two 150 h.p. engines.

THE ALUMINIUM DEVELOPMENT ASSOCIATION, 33, Grosvenor Street, London, W.1, have issued the 1958 editions of the "Directory of Members," "List of Publications," and "List of Films, Film-strips and Wall Charts." These pamphlets, which contain much useful information are all available to readers on writing to Grosvenor Street.

A SPOKESMAN in London for the International Nickel Company of Canada, Limited, confirmed an announcement made in Copper Cliff, Ontario, that another curtailment in nickel production is being made effective on July 14, and that the curtailment will reduce the company's production of nickel to a rate of approximately 89,000 tons per year.

TO COINCIDE with the centenary of the successful launching of the Bessemer Process in Sweden, the firm which pioneered this development—Sandvikens Jernwerks—are, through Sandvik Swedish Steels, Limited, putting into operation a £250,000 factory at Halesowen. This Birmingham concern has been established 44 years, mainly as stockists, but now a number of items are to be manufactured.

FALLS OF PERSONS represent the major cause of death in industry every year, Mr. William H. Morris, secretary of the Sheffield area industrial group of the Royal Society for the Prevention of Accidents, stated recently at the Grand Hotel, Sheffield, at the start of a campaign to reduce the number of accidental falls in Sheffield factories. An effort is being made to get smaller Sheffield firms into the group.

THE PETITION of Thomas W. Ward, Limited, of Sheffield, for the compulsory winding up of Project Mayflower, Limited, succeeded on July 7, when Mr. Justice Wynn-Parry made an order. Ward's were judgment creditors for £547. The petition had been adjourned on a number of occasions, but creditors whose debts far exceeded that owing to Ward's, and who had opposed the petition, had now withdrawn their opposition.

SIR JOHN COCKCROFT, former director of Harwell Atomic Energy Research Establishment, speaking on "Science and the Modern World" at the University of Leeds Convocation Lecture on July 5, said that Britain's young scientists could more than hold their own in the world. He went on to say that he thought this country was losing far too many of its scientists and engineers and it was essential that conditions of working should be made as attractive as possible in this country. Sir John had opened the University's computing laboratory, earlier.

SEVENTEEN PROFESSORS of science and engineering from British universities attended a four-day conference (July 7 to 10) organized by the United Steel Companies, Limited, on the relation of scientific research to production. The conference, was the first of its kind to be held by the company. During their stay, the professors visited United Steel's research and development department at Rotherham in addition to three of the company's steelmaking branches—Appleby-Frodingham Steel Company, Scunthorpe, Steel, Peech & Tozer, Rotherham, and Samuel Fox & Company, Limited, Stocksbridge.

THE FIRST SLAB was rolled last week in the new

£500,000 steel-plate rolling mill at the Scunthorpe works of Appleby-Frodingham Steel Company, a branch of the United Steel Companies, Limited. This marks the completion of the first stage of a £6,000,000 development scheme which will lead to a considerable increase in the output of steel plates for the shipbuilding and constructional engineering industries. Improved surface finish, closer rolling tolerances and more accurate gauge across the width of the plate are other features associated with the mill's higher production. Initially, it will produce about 9,000 tons per week.

Argus and Catton Merger

The boards of G. & J. Weir, Limited, and Catton & Company, Limited, have decided to combine their foundry activities by forming a new company, Weir-Catton, Limited, to acquire the capital of Catton & Company, Limited, and the capital of Argus Foundry, Limited, a wholly-owned subsidiary of G. & J. Weir, Limited. This arrangement should be mutually advantageous, as it will result in a strong broadly-based business supplying steel, iron and non-ferrous castings, and at the same time will enable production facilities to be used to the utmost advantage by the pooling of sales, technical, and other resources. The share capital of Weir-Catton, Limited, will be owned as to 50 per cent, by G. & J. Weir, Limited, and as to 50 per cent. by the existing shareholders of Catton & Company, Limited. It is hoped that the new company will be formed before September 30, 1958. Under the new arrangement the name of Argus Foundry, Limited, will be changed to Weir Foundries, Limited.

Babcock & Wilcox in Nuclear Scheme

Arrangements have been made under which Babcock & Wilcox, Limited, and the Babcock & Wilcox Company of the US will extend their technical collaboration into the nuclear power field, both companies, it is stated, having gained experience in different fields of nuclear engineering. The companies are claimed to be two of the world's largest manufacturers of nuclear and conventional steam power plant.

The British company has had about 10 years' experience in the nuclear field, and, as a member of the English Electric, Babcock & Wilcox, Taylor Woodrow Atomic Power Group, is at present engaged on the construction of the world's largest nuclear power station at Hinkley Point (Somerset). The American company entered the nuclear field rather earlier and has designed and constructed many pressure vessels and heat exchangers; it also has a contract to supply the complete propulsion plant for the first nuclear-powered merchant ship, the n.s. Savannah.

Edgar Allen's Slackening Demand

Very definite slackening in demand in some sections towards the end of the year to March 29, 1958, is reported by the directors of Edgar Allen & Company, Limited, the Sheffield steelmakers. Volume and value of orders on hand have thus been reduced—"not too seriously so far"—and unless demand picks up this may well have an adverse affect on the current year's trading.

In 1957-58 the value of group sales was a record and some 6 per cent. higher than previously. The parent company contributed about 70 per cent. of the total. Group net profits expanded from £257,150 to £375,746. The dividend remains at 12½ per cent. Fixed assets are higher at £1,994,285 (£1,874,842), and net current assets amount to £2,333,336 (£2,215,382). Outstanding commitments total £116,465 (£99,524).

Dinner

NORTHERN BRASS FOUNDERS' EMPLOYERS' ASSOCIATION

The Northern Brassfounders' Employers' Association celebrated its diamond jubilee at a dinner at the Hotel Majestic, Harrogate, on Friday, July 11. The president, Mr. A. Creighton, was in the chair, and guests included Mr. J. T. Colman, president, National Brassfoundry Association, Mr. M. W. McDonald, senior vice-president, and Mr. A. H. Wilson, immediate past-president; Mr. H. Brown, vice-president of the Northern Association, and Mr. C. M. Smith, immediate past-president; Mr. E. N. Hiley, secretary of the National Association, and Mr. R. C. Lambert, secretary of the Northern Association. The Northern Association has always been administered from Rotherham and provided the first president in 1898. He was the late Alderman George Gummer.

Shotton Bros'., Opening

On Monday and Tuesday of this week, "open days" were held at the new Halesowen foundry of Shotton Bros., Limited, to officially launch the extension (described on page 67 of this JOURNAL). Welcoming members of the Press, representatives of customers and associated firms after luncheon on Monday, Mr. E. R. Shotton, managing director (who is over 80), said that this represented the first stage of the development of a 10-acre site, and acknowledged co-operation received from the local authorities during the planning and erection. He also paid a tribute to Mr. Herbert Hill, chairman of Birfield Industries, Limited (of which firm Shotton Brothers is a wholly-owned subsidiary), for the happy associations which had followed the merger. Councillor Garver, mayor of Halesowen, also spoke, welcoming Shotton's to the area and promising full and continued co-operation.

Before the delegates toured the works, Mr. Hill explained the integration of Shotton's activities with the Birfield Group and his satisfaction with the way business developments were progressing. At tea, which followed the visit, Mr. John Clements of Commer Cars, Limited, Dunstable, expressed the gratitude of the visitors for hospitality received and said how impressed he had been to inspect the new foundry, where the sweat and toil so often associated with foundrywork had been largely eliminated by mechanical aids. Other guests were entertained in a similar manner on Tuesday; about 150 touring the works during the two days.

Glasgow Firm Acquired

The Glasgow firm of J. & J. Neil (Temple) Limited, combustion engineers, Temple Park Iron Works, have been acquired by James Hodgkinson (Salford) Limited. Messrs. Neil have been appointed sole representatives in Scotland for Bennis Combustion Limited, of Walkden, Manchester, and Bennis Mechanisations Limited and Saxon Engineering Company, Limited, both of Stoke-on-Trent. All these concerns are members of the Hodgkinson group of companies. Mr. J. Douglas Cooper, chairman of J. & J. Neil, will personally supervise this representation.

LEADING MIDLAND MEMBERS of the National Union of Manufacturers visited Newport on July 10 to inspect the dock facilities at the Monmouthshire port. They were invited by Newport Corporation as part of its drive to attract more Midland traffic through its docks. The visit follows an exhibition staged by Newport Corporation in May.

Company News

RADIATION, LIMITED—Acceptances were received in respect of over 94 per cent. of the ordinary stock of Parnall (Yate), Limited, domestic electrical and mechanical engineers, of Bristol, up to June 30, the closing date of the offer. Allotment letters and cheques were despatched on July 10.

PRESSED STEEL COMPANY, LIMITED—The company announces that of the £2,000,000 5½ per cent. convertible debenture stock 1977-82 issued in April, 1957, there was converted under the terms of the issue during June, 1958, £466,425 of the stock against which there has been allotted 652,995 5s. ordinary shares.

CLIFFORD MOTOR COMPONENTS, LIMITED—With a final payment of 22½ (20) per cent., payable September 12, the company is increasing the total dividend for the year ended March 31 to 30 (27½) per cent. Group net profits were returned at £296,289 (£281,541) after tax of £343,246 (£299,824) and after writing back tax overprovisions of £9,650 (£5,466).

AITON & COMPANY, LIMITED, pipework specialists and ironfounders, of Derby—The company is paying a final dividend of 7½ per cent., making 10 per cent. for the year to March 31, 1958, on the £750,000 capital as increased by a two-for-one scrip issue, against the equivalent of 8½ per cent. Group trading profit fell to £497,357 (£537,300). The directors state that although profits on contracts completed in the year are slightly down, the gross value of work in progress has increased appreciably.

BIRFIELD, LIMITED, general engineers, of London, W.1—Sales for the nine months to April 30, 1958, were £15,368,000, compared with £12,007,000 for a period of eight months and 20 days to April 30, 1957. For the same period the net trading surplus is £1,160,000 (£739,000), calculated after deduction of all trading outgoings including depreciation, but before tax and reserve for increased replacement of fixed assets. The figure is approximate as the stock and work in progress have not been physically examined

HICK, HARGREAVES & COMPANY, LIMITED, engineers, ironfounders, and millwrights, of Bolton—A final dividend of 10 per cent., plus a 5 per cent. bonus, makes 20 per cent. for the year to March 31, 1958, on the £852,000 capital as increased by shares issued against the acquisition of Foster, Yates & Thom, Limited, heavy precision engineers and boilermakers, of Blackburn. For last year a total of 18½ per cent. was paid, along with a 3½ per cent. bonus, on a £756,000 capital. To increase the authorized capital to £2,000,000 a one-for-two scrip issue is proposed. Consolidated net profit of the company for a year and of the subsidiaries for 18 months is £419,487.

NORTH BRITISH LOCOMOTIVE COMPANY, LIMITED—The company has informed stockholders that trading in 1958 will show a loss. In April, Mr. T. A. Crowe, chairman, stated that if nothing unforeseen occurred it was confidently anticipated that with an increased output, the company would again be earning a profit. Difficulties have, however, it is stated, been experienced in building up production of the higher powered North British-M.A.N. diesel engines and North British-Voith transmissions, which have delayed the completion of locomotives. It is felt that these difficulties have now been largely overcome, but the reduced output of locomotives this year will make it impossible to absorb the overhead expenses.

HILLS (WEST BROMWICH), LIMITED—Mr. A. Wright has resigned from the board.

Metal Industries' Successful Offer to Stockholders

In announcing that the recent offer to stockholders of £1,500,000 ordinary stock in the British Oxygen Company, Limited, had been "fully successful," the directors of Metal Industries, Limited, stated that of the £1,297,700 stock available to ordinary stockholders under letters of entitlement, £1,257,515, or almost 97 per cent., had been taken up. For the remaining £242,485 stock, which was offered to both ordinary and preference stockholders, applications totalled £1,194,015, or nearly five times the amount available.

Announcing the basis of the allocation of the excess stock the company stated that no stockholder, whatever the amount of his application, would receive a larger allocation of excess stock than the amount of his holding in Metal Industries. Subject to this qualification, allocations would be made on the following basis:—Applications for up to £50 stock, in full; from £51 to £100, £50 each; from £101 to £250, half the amount applied for; from £251 to £400, £125 each; from £401 to £500, £150 each; for £501 and over, in approximate proportion to the applicants' stockholding in Metal Industries as recorded in the register at July 1, subject to a minimum of £150. Where a member holds more than one class of stock, his holdings would be aggregated for purposes of the above calculations.

Metal Industries group net current assets increased from £4,746,977 to £5,172,441 in the year ended March 31, 1958, and of current assets of £5,511,930 (£5,291,330), there is £1,382,978 cash (£771,467 including Treasury bills). In addition, investments, including £1,500,000 of British Oxygen ordinary stock since sold to stockholders, total £3,129,098 (£3,127,399).

The chairman, Sir Charles R. Westlake, says that this satisfactory position enables the group to contemplate an expanding future with confidence. Since the accounts the British Oxygen operation has brought in about £2,149,000 after allowing for expenses. The sale has more than trebled the group's general capital reserve from £512,153 to over £1,600,000. This operation, adds Sir Charles, has substantially augmented resources, and the board has under active consideration the development of the group by the entry into allied or complementary fields to those already engaged in.

Net expenditure of approximately £430,000 on fixed assets exceeded depreciation of some £290,000. Considerable amounts were expended to make good arrears of expenditure in previous years in the metals division, and it will be necessary to continue that policy. The board has "reasonable confidence" in the future and an interim statement will again be issued covering results for the first 28 weeks of the financial year.

Recent Wills

COOPER, WILLIAM, foundry manager of the Shaw Foundry Company, Willenhall (Staffs) £3,170

SMITHSON, G. R., founder of G. R. Smithson & Company, Limited, iron and steel merchants, chainmakers, etc., of Wolverhampton £95,216

WILLIAMS, CHARLES, chairman and managing director of Samuel Smith & Sons, Limited, ironfounders, of Smethwick (Staffs) £5,417

HODGKISS, L. J., joint managing director of Tarmac, Limited, Ettingshall, Wolverhampton, a member of the executive council of the British Slag Federation, and a member of the council of the Federation of Coated Macadam Industries ... £39,122

GODDARD, SIR JOSEPH HOLLAND, president of Wadkin, Limited, manufacturers of woodworking machinery and patternshop equipment, of Leicester, former chairman of the Imperial Typewriter Company, Limited, and former president of the Machine Tool Trades Association ... £246,794

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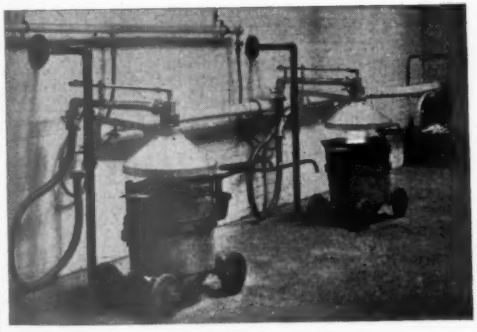

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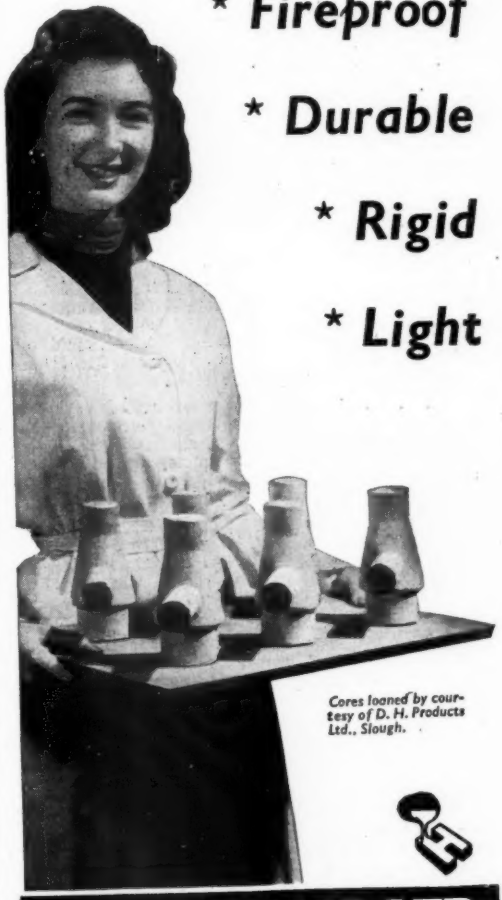

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Personal

Mr. DAVID W. DUGUID has been appointed to the board of P. & W. MacLellan, Limited.

Mr. ROBERT YOUNG, B.E.M., has been appointed chief inspector of the Salterpak division of Geo. Salter & Company, Limited, West Bromwich.

Mr. GEORGE GRAHAM, a member of the commercial department of Jones & Campbell, Limited, Torwood Foundry, Larbert (Stirlingshire), has retired after completing 57 years' service with the company.

Mr. A. F. PATES, managing director of the Whittington Engineering Company, Limited, and the Derbyshire Carriage & Wagon Company, Limited, has been installed as president of Chesterfield Rotary Club for the coming year.

Mr. WILFRED WICKS has resigned as secretary of Peglers, Limited, brassfounders, manufacturers of steam and water fittings, of Doncaster, but continues as a director. He has been succeeded as secretary by Mr. JOHN W. EMBERTON.

Mr. J. R. SAINSBURY, assistant chief engineer of the Tyne Improvement Commission, recently received a presentation on his leaving the commission to take up a new appointment as chief engineer of the South Australian Harbours Board.

Mr. MASUD KARIM, a director of Guest Keen & Nettlefolds in Pakistan, Limited, arrived in this country recently. Mr. Karim will be here for about two months and will visit production centres in the Guest Keen group and other works.

Miss MARTHA PRITCHARD, who has retired from the staff of Williams & Williams, Limited, manufacturers of metal windows and doors, of Chester, received a presentation from employees of the firm and other friends in appreciation of the help she has given to others during her 40 years' service.

Mr. J. R. MUNRO, director of manufacturing and acting manager of the new Glasgow plant of the Caterpillar Tractor Company, Limited, has been elected a vice-president of the parent company in Peoria, Illinois, and will assume administrative responsibility for the activities of its manufacturing division.

A special dinner was held at Leek, Staffordshire, recently to mark the retirement, after 52 years' service with the British Aluminium Company, Limited, of Mr. E. F. CLOWES. He started work at 13 and at the age of 16 was operating a wire-drawing machine. In 1937 he was promoted foreman, and later became shift superintendent.

Mr. S. E. WILLETT, managing director of the Clayton Dewandre Company, Limited, Lincoln, has decided not to renew his contract as managing director on its expiry. Mr. Willett, who has served the company beyond the normal retiring age, remains on the board. Mr. S. J. BARNES, a director and general manager, will be responsible for the duties previously carried out by Mr. Willett.

Mr. JOHN GRIMSTON, MP, managing director of Enfield Rolling Mills, Limited, has been re-elected president for the coming year of the British Non-Ferrous Metals Federation. Mr. M. COOK and Mr. W. W. DOLTON have been re-elected vice-presidents and Mr. W. F. SLATER and Mr. M. J. S. CLAPHAM have been elected vice-presidents. Mr. A. L. JOHNSON has been re-elected treasurer.

The Combustion Engineering Association, 6, Duke Street, St. James's, London, S.W.1, announce that Mr. J. R. CLARKE has been appointed to the Technical staff of the Association. Mr. Clarke, who is a member of the Institute of Marine Engineers, retired from the Royal Navy as a Lieutenant-Commander in 1955 after 30 years service in the engineering branch. Since 1955, Mr. Clarke has gained civil experience in the engineering industry.

Mr. CHARLES STOKES, a director and former secretary of Thomas Firth & John Brown, Limited, Sheffield, received presentations on July 7, to mark his retirement. He has been a director for seven years and altogether served 55 years. He joined John Brown & Company, Limited, at the age of 14 and earned 5s. (gold) a week as an office boy. He gave up the post of secretary in 1954, but continued with special responsibility in financial matters.

Professor RICHARD WECK of Cambridge University, has accepted an invitation to be lecturer during a three-day "Seminar on Residual Stresses" being sponsored by the American Society for Metals at Cleveland, Ohio, USA, October 30 to November 1. Dr. Weck is director of the British Welding Research Association at Abington Hall, Cambridge, and was recently made a director of John Harper & Company, Limited.

Mr. E. HAMPSHIRE, technical superintendent, spring manufacture, with Samuel Fox & Company, Limited, a subsidiary of the United Steel Companies, Limited, has been appointed production controller. He succeeds Mr. D. A. HOPKINS, who is joining United Steel's department of operational research and cybernetics. Mr. A. ASPINALL, formerly assistant manager of the laminated and coil spring departments, is appointed liaison engineer (springs).

Sir ALEXANDER SIM has been appointed chairman and director of Henley Foundries, Limited, Cradley Heath, Staffs, as from June 30 upon the retirement of Sir John Dalton, M.I.E.E., F.C.I.S. Sir Alexander, who is a chartered accountant (Edinburgh 1930), spent the early part of his career in India where he joined Andrew Yule & Company, of Calcutta in 1930. He was appointed director in 1939, deputy chairman in 1948 and chairman in 1953, holding this position until 1956 when he retired from India. During this period he acted as Commissioner for the port of Calcutta from 1950/55, was vice-president of the Bengal Chamber of Commerce and Industry in 1954/55 and president in 1955/56. He was president of the Chambers of Commerce of India in 1955/56, and also served on numerous trade associations and financial committees in India. Returning to this country, he became a director of Yule Catto & Company, Limited, East Indian merchants, of London and in June 1957, joined W. T. Henley's Telegraph Works Company, Limited, as a director.

Board Changes

MASSEY-FERGUSON (HOLDINGS), LIMITED—Mr. Anthony Hurd, MP, has joined the board.

CONSTRUCTORS JOHN BROWN, LIMITED—Sir Norman Hulbert, MP, has been appointed a director.

BUTLER MACHINE TOOL COMPANY, LIMITED—Mr. George Butler, chief designer of the company, has been appointed a director.

GRAHAM FIRTH STEEL PRODUCTS, LIMITED—Mr. Charles Cooper has resigned from the board owing to other commitments.

ENGLISH STEEL CORPORATION, LIMITED—Mr. E. J. Waddington has resigned from the board. He has recently reduced his business commitments owing to continued ill-health.

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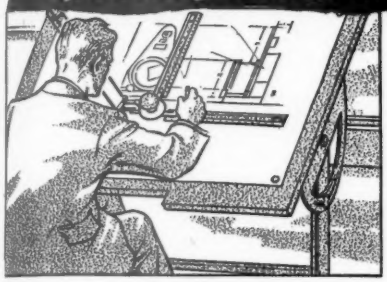

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Raw Material Markets

Iron and Steel

Plentiful supplies of raw materials enable the foundries to obtain all their requirements without difficulty and production of pig-iron in all grades still exceeds demand. The approach of the annual holidays, coupled with the uncertainty of trade and the expectancy of a change in prices, has made foundries even more cautious than they were in booking supplies. They are holding a minimum of stock and producers have to meet urgent calls for immediate consumption from their own stocks.

The engineering and speciality foundries continue to take up appreciable tonnages of low-phosphorus irons, hematite, and some refined irons, but makers of these grades can easily satisfy requirements. The foundries catering mainly for high-duty castings for the motor vehicle trade maintain good outputs, although in some instances there has been a reduction on previous levels; this is shown in their present demands for pig-iron. The machine-tool trade and some of the engineering foundries are not indenting for the same tonnage of castings as they were a few months ago. The overall demand for castings, however, from the engineering and speciality foundries, keeps them much better employed than other sections of the trade.

The light foundries in particular are very quiet. With their mechanized capacity for increased production, a much greater volume of work is required, but many of these plants are only partially employed. The easing of the economic squeeze is a step in the right direction for the trades, including domestic equipment and building to whom castings are supplied.

The textile and many of the jobbing foundries are in need of more work. The demand from these and the light foundries for high-phosphorus pig-irons is on a moderate scale, and output is much greater than the tonnage called for.

Some orders for pig-iron are being obtained from overseas buyers, but generally the keen competition from makers abroad makes it increasingly difficult to obtain business. In some instances prices are well below UK figures. The foundries are well provided with scrap, foundry coke, ganister, etc., and have no difficulty in obtaining the required supplies.

There appears to have been some slight improvement in the demand for steel semis during the last week or two, mainly due to depletion of stocks at the re-rolling mills. The amount of business being placed with the re-rollers does not, however, show much sign of improvement. Many establishments continue on a shortened working week and orders are so scarce that it is extremely difficult to provide sufficient tonnage for the reduced number of shifts. Some business is on hand for the export market, but the amount is small as lower prices are quoted by overseas producers.

Home steelworks are able to satisfy promptly the present demands for steel semis, and these tonnages could be increased appreciably if necessary. The re-rollers, however, are using up stocks whenever possible and are only specifying fresh supplies when necessary and this usually results in urgent calls on the steelworks.

Non-ferrous Metals

Notwithstanding the fact that, including curb transactions, over 6,000 tons of copper changed hands on Tuesday of last week, the average daily level of activity is now at a lower level. This is, of course, due to the arrival of the holiday period, and quiet seasonal influences are likely to make themselves felt over the weeks ahead. The splurge of buying on the one day mentioned was thought to be in connection with an order for copper wire from the USSR. This is not the first time that the Soviet Union has been mentioned as being a prospective buyer of large quantities of copper wire, but actual facts of any purchases have not been made available. Meanwhile, the undertone is quietly firm and the stock position in this country indicates a continuance of a healthy production/consumption situation.

The copper market in the United States is not clear. Contrary to expectations Kennecott has not followed Phelps-Dodge and Anaconda in raising its price, so that there are three different quotations. The custom smelters are quoting 26 cents a pound, two primary producers, Phelps-Dodge and Anaconda, are offering the metal at 26¼ cents, and Kennecott is selling at 25 cents a pound. The important point from the viewpoint of the market is that Kennecott is the largest producer and, indeed, accounts for about 65 per cent. of the total US production. Thus if there is to be uniformity of price odds are that Phelps-Dodge and Anaconda will have to come into line with Kennecott rather than *vice-versa*. Pressure on the primary producers' prices comes from their respective clients. And Kennecott's customers who are mainly independent fabricators are basing the price of their products on 25 cents a pound copper. On the other hand, fabricating subsidiaries of Phelps-Dodge and Anaconda are selling their products at prices based on copper at 26¼ cents a pound.

Tin is featureless and demand routine. The buffer stock manager has had to support the market for small tonnages. The forward price is once more above the support point for cash metal of £730 a ton. In the United States, the market is quiet and the price is below 94 cents a pound.

Lead is quiet on both sides of the Atlantic. The market in London has been slightly affected by the arrival of metal from European sources. In New York the price is 11 cents a pound.

Zinc is featureless in London, but better in the United States where improved buying of "Prime Western" grades by steel mills and special high grades by die-casters has been noted. The US price is still 10 cents a pound.

German Steel Output Maintained

German steel output amounted to 11,871,000 tons in the first half of this year, compared with 11,868,000 tons in the first half of 1957. June output was 1,857,000 tons, compared with 1,874,000 tons in May and 1,845,000 tons in June, 1957. June's average daily output was 72,826 tons, compared with 73,397 tons in May—a decline attributable to the closure of some open-hearth furnaces at the Thyssen Steelworks.

"No agreement has been reached on the issue of price increases in exports to third countries," stated the commercial committee of the Brussels Steel Cartel after three days of talks at Düsseldorf recently. The committee stated that it felt that the overall position in steel did not warrant a price increase; but the German delegation is known to have dissented.

KEIGHLEY LIFTS, LIMITED, have bought the Dryart Mills in Keighley, formerly occupied by dress-goods manufacturers, to convert to engineering purposes. There is 100,000 sq. ft. of floor space contained partly in a three-storey block and a larger single-storey block. The single-storey portion is to be raised and other alterations made at a cost of £100,000 which will increase the labour forme from 500 to 800 over the next two years.

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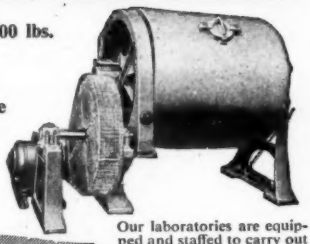

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

July 16, 1958

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S.1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £47 0s. 0d. to £47 10s. 0d., scale 17s. 0d. per unit; 75 per cent. Si, £66 0s. 0d. to £66 10s. 0d., scale 17s. 0d. per unit.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 6s. 6d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 9s. 6d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £91 10s. 0d., basis 60 per cent. Cr, scale 30s. 0d. to 30s. 6d., per unit; over 6 per cent. C, £87 10s. 0d., basis 60 per cent. Cr, scale 30s. 6d. per unit; 2 per cent. C,* 2s. 0d. per lb. Cr; 1 per cent. C,* 2s. 0½d. per lb. Cr; 0.15 per cent. C,* 2s. 1½d. per lb. Cr; 0.10 per cent. C,* 2s. 1¾d. per lb. Cr; 0.06 per cent. C,* 2s. 2d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £265 0s. 0d.; 96/98 per cent., £295 0s. 0d.

Ferro-columbium.—65/72 per cent., Nb + Ta, 19s. 9d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £78 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t. £32 15s. 6d.; tested, 0.08 to 0.33 per cent. C, £33 15s., 6d.; hard (0.41 to 0.60 per cent. C), £34 17s. 0d.; silico-manganese, £43 16s. 6d.; free-cutting, £36 14s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

* Average 68-70 per cent.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 2s. 0d.; boiler plates (N.-E. Coast), £44 12s. 0d.; floor plates (N.-E. Coast), £43 11s. 0d.; angles (N.-E. Coast), £39 16s. 6d.; joists (N.-E. Coast), £39 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats, 5 in. wide and under, untested soft basic, 50 tons and over, £40 0s. 6d; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, £39 0s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £44 16s. 0d.; black sheets (hand mill), 24g., £58 14s 6d.; galvanized corrugated sheets, 24g., £66 16s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 11s. 0d.; nickel-chrome-molybdenum, £111 19s. 0d.

NON-FERROUS METALS

Copper.—Cash, £200 10s. 0d. to £200 15s. 0d.; three months, £201 5s. 0d. to £201 10s. 0d.; settlement, £200 15s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 1s. 10½d. per lb.; rods, 224s 9d. per cwt. basis; 20 s.w.g., 257s. 3d. per cwt.

Tin.—Cash, £730 10s. 0d. to £731 0s. 0d.; three months, £733 10s. 0d. to £734 0s. 0d.; settlement, £731 0s. 0d.

Lead (Refined Pig).—Second half July, £72 0s. 0d. to £72 5s. 0d.; second half October, £73 2s. 6d. to £73 5s. 0d.

Zinc.—Second half July, £65 5s. 0d. to £65 15s. 0d.; second half October, £65 15s. 0d. to £66 0s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £96 2s. 6d.; rolled zinc (boiler plates), all English destinations, £93 17s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £85 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 6½d. per lb.; sheets to 10 w.g., 165s. 0d. per cwt.; wire, 2s. 4½d.; rolled metal, 165s. 0d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £136; B6 (55/15), £185; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £174; HTB2 (38 tons), — ; HTB3 (48 tons), —.

Gunmetal.—BS1400, LG2 (85/5/5/5), £165; LG3 (86/7/5/2), £176; G1 (88/10/2/½), £234; (88/10/2/1), £224.

Phosphor Bronze.—BS1400, PB1 (AID released), £249 per ton.

Phosphor Bronze Strip, etc.—Strip, 248s. 9d. per cwt.; wire, 3s. 7¾d. per lb.; rods, 2s. 11¾d.; tubes, 2s. 11¾d.; chill cast bars: solids 2s. 11¾d.; cored 3s. 0¾d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 6½d. per lb.; round wire, 10g. in coils (10 per cent.), 3s. 11d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 3s. 10d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £78 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £190 0s. 0d.; aluminium bronze (BS1400), AB1, £197; AB2, —.